PLANT COMMUNITIES OF THE BLUE MOUNTAINS IN EASTERN OREGON AND SOUTHEASTERN WASHINGTON

U.S.D.A.
FOREST SERVICE
PACIFIC NORTHWEST REGION
R6 Area Guide 3–1
SEPTEMBER 1973

PLANT COMMUNITIES OF THE BLUE MOUNTAINS

IN EASTERN OREGON AND SOUTHEASTERN WASHINGTON

Frederick C. Hall
Principal Plant Ecologist

September 1973

U.S.D.A.
Forest Service
Pacific Northwest Region
R6 Area Guide 3-1

INDEX

Plant community descriptions are organized by similarity in dominant plants and environment. Thus, all meadow types are together and occur first. Then low elevation communities are grouped by grass dominance, shrub dominance and tree dominance. Forest communities are organized roughly by elevational occurrence and by similarity in dominant trees. Non-forested alpine openings are listed last. The Index may be used as a "mini key" to identification of community types as well as an index to where they are described.

PLANT COMMUNITIES OF THE BLUE MOUNTAINS IN EASTERN OREGON AND SOUTHEASTERN WASHINGTON

The 5 million acre Blue Mountains vary from undulating plateaues to steep, rugged mountains. They contain many geological formations including recent lava flows, sedimentary rocks, volcanic tuffs, intrusive granitics and serpentines. These combinations have produced a wide variety of soils and plant communities. This paper describes 44 of the more important types of plant communities and their soils.

Granodiorite Elkhorn Mountains of the central Blue Mountains: Alpine sagebrush openings with whitebark pine, sub-alpine fir forest and snow slides.

Northern Blue Mountains are a steeply dissected basal plateau: steep slope and flat "slope" bunchgrass with fir-big huckleberry on north slopes.

Mid Blue Mountains of rolling to dissected topography on tuffs and lavas: larch (light colored trees) in fir-big huckleberry and fir-twinflower-forb, lodgepole pine (fine texture), and shrubby openings due to shallow soil.

South central Blue Mountains of rolling to steep rolling topography on tuffs, lavas, sedimentary rocks: mixed conifer-pinegrass, climax pine types.

South western Blue Mountains on flow lavas of recent geological time: stiff sage scabland on very shallow soil amoung mixed conifer pinegrass and climax pine types.

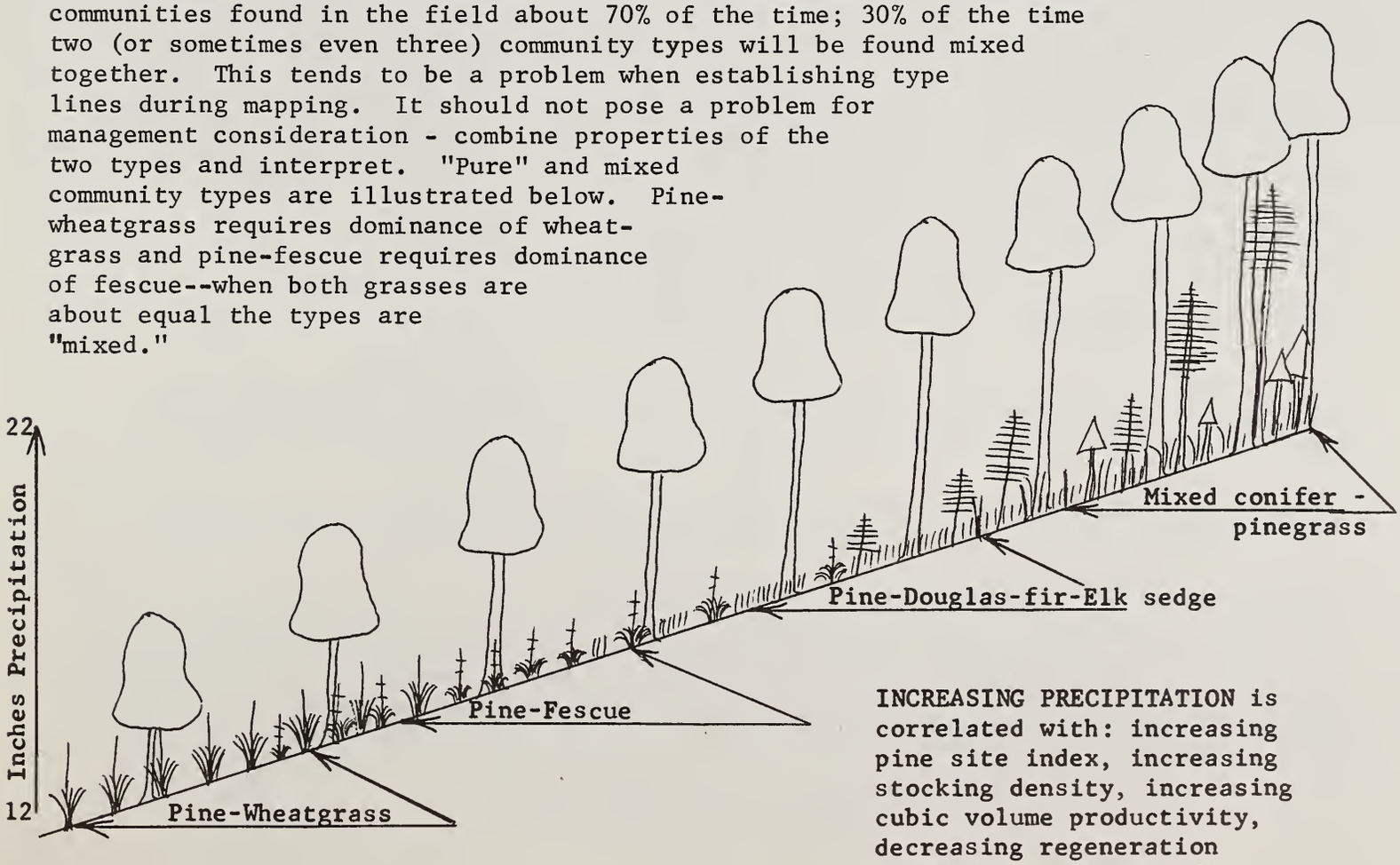
CLASSIFICATION CONCEPT

Plant communities have been classified by either of two apparently opposite philogophies, the continuum or the discrete community (habitat type). Concepts from both have been used for this study. A continuum in environment and climax vegetation was assumed. Sampling was designed to encompass variability in soil, elevation, topography, climate and vegetation. In this way, comprehensive evaluation of vegetation and environmental variability was obtained.

Plant communities were grouped into "plant community types" to facilitate land management. These community types are used as the basis for range condition and trend guides, forest stockability guides, silviculture guides, vegetation response to management guides, and for mapping the vegetation resource. The following criteria had to be met for each type in order of priority: 1) It differs from all other types in land management limitations or opportunities. 2) It can be recognized on the ground in any stage of disturbance. 3) It should have limited variability in species composition. 4) It should have limited variability in productivity. For example, wheatgrass-fescue types were grouped according to slopes greater or less than 25%, the point where seed drilling and livestock travel both become difficult.

Since each community type encompasses part of a contiuum gradient, multiple correlation analysis was used to estimate vegetation and environmental "indicators." These indicators may be used to refine estimates of productivity, revegetation, or silviculture. For example, the presence of bitterbrush in the Ponderosa - Douglas-fir - elk sedge type indicates low tree productivity, whereas lack of bitterbrush and presence of pinegrass indicates best tree growth for the type.

Plant community types illustrated on the following pages will represent communities found in the field about 70% of the time; 30% of the time two (or sometimes even three) community types will be found mixed together. This tends to be a problem when establishing type lines during mapping. It should not pose a problem for management consideration - combine properties of the two types and interpret. "Pure" and mixed community types are illustrated below. Pine-wheatgrass requires dominance of wheatgrass and pine-fescue requires dominance of fescue--when both grasses are about equal the types are "mixed."



INCREASING PRECIPITATION is correlated with: increasing pine site index, increasing stocking density, increasing cubic volume productivity, decreasing regeneration problems, increasing fir.

EXPLANATION OF DESCRIPTIONS

Name and Number: Each community type is given a name and a code number. The code number is fully described in Pacific Northwest Ecoclass Identification, R6 Regional Guide 1-1. It is designed for use with TRI System, as an identifier for computer analysis, as a type designator in mapping, or for other uses where an abbreviation is required. Scientific names of the plants are contained in ( ) and the former code for Blue Mountain Mapping Types is also noted in ( ).

Range Condition Guide: These guides are listed by their functional file number. Stocking and silviculture guides will be listed when published.

Environment: All notations are in feet or inches. When exceptions occur they are noted in ( ). For example, "Stonyness: 25-50% (0)" means that stonyness ranges from 25-50% of the soil volume with occasional soils have no stone.

Vegetation: Dominants: Those plants, expressed by percent crown cover, characteristically dominating the community under good range conditions (ground vegetation) and those trees which are most commonly dominant under average, unlogged stand conditions. Average stand conditions do not always represent climax forest dominants; note plant status in the "Status" column. Status: A decreaser is a plant so palatable that it is the first to decrease under excessive grazing; it is a key indicator plant for determining range condition and estimating range trend. An increaser is a plant low in palatability which tends to increase in numbers or relative dominance under heavy grazing. Under proper grazing management, an increaser will decrease to its former abundance as the more palatable plants increase (upward range trend). An ice cream plant is one of very high palatability but low occurrence in the stand.

Productivity (forested types); Herbage is the pounds per acre, in good range condition, of all grasses and forbs, air dry; no allowance is made for "proper use factors." Site index for Douglas-fir (DF) and ponderosa pine (PP) is based on height at age 100 years; all others are for height at age 50 years (lodgepole pine = LP, white (grand) fir = WF, western larch = WL, subalpine fir - AF, Engelmann spruce = ES). TBA means the total basal area of the stand. GBA means growth basal area for the stand-that basal area at which crop trees (dominants) grow at 15 rings per inch. Cu. ft. per yr. is the cubic volume growth index for the type--it represents a potential which may not be attained with management. Mean is the average for the type; 5% level is the confidence interval at the 5% (95) probability level (i.e., Site Index for DF at a mean of 82 and a 5% level of 8 means that 95 times out of 100 a stand of this community type can be expected to have a Douglas-fir site index between 74 and 90 or 82 $\pm$ 8).

Characteristics (non-forest types): Each item represents data for good range condition. Zeros are entered if the various items are not part of good range condition. Mean and 5% level have the same meaning as above.

Range Condition: Estimate condition using the listed decreasers only. Use 0.96 sq. ft. plot in meadows and 9.6 sq. ft. plot for all other types. Crown cover is estimated by averaging several plots for crown cover. Number of plants are those rooted partially or wholly within the plot. In poorer range condition, up to 10 plots may be required for a good estimate of condition.

Kentucky bluegrass
P. pratensis

Tufted hairgrass
Deschampsia cespitosa

California danthonia
Danthonia californica

DRY MEADOW MD- (2D)

Range Condition Guide: **Mountain Meadow R6-2210-C7**

ENVIRONMENT
Slope position: **bottom**
Aspect: **any**
% slope: **less 10 (25)**
Elevation: **2500-6500**
Topography: **various**

SOILS
Geology: **alluvium**
Total depth: **20-60 inches**
Effective depth: **20-60 inches**
Stonyness: **0-25%**
Texture: **loams to clay loam**
Structure: **moderate to strong**
Special:

VEGETATION

Dominants	% Cover	Status
Tufted hairgrass	**10-40 (60)**	**Decreaser, minimal site**
Kentucky bluegrass	**40-80**	**Increaser/decreaser**
California oatgrass	**0-30**	**Decreaser**

Dry meadows are moist to wet in the spring, but dry moderately to severely by fall. They do not have a perched water table or freely available water within rooting distance of plants (i.e., not sub-irrigated) throughout the growing season.

No dry meadows could be found in good condition in the Blue Mountains. Therefore, a list of decreasers and a condition guide have not been published. While Poa pratensis is introduced, it withstands heavy grazing pressure and protects the soil very well. Until additional information is available, consider Poa pratensis a decreaser.

Middle Fork on the John Day River: dry meadows ar light tone, moist meadow darker, all dominated by Kentucky bluegrass.

CHARACTERISTICS

	Herbage	Surface Rock	Erosion Pavement	Bare Ground	Moss
Mean	800 lbs				
5% level	300 lbs				

RANGE CONDITION

Good: **80% cover or XX + plants**
Fair: **40 - 79% or XX - XX plants**
Poor: **5 - 39% or XX - XX plants**
V. Poor: **no decreasers**

Kentucky Bluegrass dominant.

MOIST MEADOW MM- (2M)

Range Condition Guide: **Mountain Meadows R6-2210-C7**

ENVIRONMENT
Slope position: **bottom**
Aspect: **any**
% slope: **less 10 (25)**
Elevation: **2500 - 6500**
Topography: **various**

SOILS
Geology: **alluvium**
Total depth: **20-60 inches**
Effective depth: **20-50 inches**
Stonyness: **0-25%**
Texture: **loam to clay loam**
Structure: **moderate to strong**
Special: **early spring moisture limits animal turn-on date**

VEGETATION

Dominants	% Cover	Status
Tufted hairgrass	20-60	**Decreaser**
Ovalhead sedge	0-40	**Decreaser, indicates wetter sites**
California oatgrass	0-40	**Decreaser, indicates drier sites**
Kentucky bluegrass	0-40	**Increaser**
Bentgrass	10-40	**Decreaser**

Good condition: Deschampsia caespitosa dominant with various amounts of sedges, Agrostis and Danthonia. Poa pratensis often becomes dominant as trend goes down. Finally, in poor and very poor condition, Veratrum (false Hellebore) and various weeds may dominate.

Moist meadows are wet to moist in the spring and are sub-irrigated or have freely available water within the rooting zone throughout the growing season. The soil surface dries sufficiently to support livestock without causing trampling damage prior to mid August.

Moist meadow dominated by Kentucky bluegrass. Stream is fed by the sub-irregation water.

CHARACTERISTICS

	Herbage	Surface Rock	Erosion Pavement	Bare Ground	Moss
Mean	1400 lb				
5% level	400 lb				

RANGE CONDITION
(Decreasers:
Good: **80% cover or XX + plants**
Fair: **40 - 79% or XX - XX plant**
Poor: **5 - 39% or XX - XX plant**
V. Poor: **no decreasers**

Tufted hairgrass and sedge dominant

WET MEADOW MW-

WET MEADOW MW- (2W)

Range Condition Guide: **Mountain Meadows R6-2210-C7**

ENVIRONMENT
Slope position: **bottom**
Aspect: **"none"**
% slope: **less 5%**
Elevation: **2500-6500**
Topography: **various**

SOILS
Geology: **alluvium, peat**
Total depth: **20-60 inches**
Effective depth: **20-30 inches**
Stonyness: **0-20%**
Texture: **peat/loam to clay loam**
Structure: **none/moderate - strong**
Special: **water standing on or at the soil surface causes soil damage when grazed by livestock**

VEGETATION

Dominants	% Cover	Status
Nebraska sedge	**50-90**	**Decreaser**
Ovalhead sedge	**20-50**	**Decreaser**
Bentgrass	**0-20**	**Decreaser**

Wet meadows are those that remain wet at or near the surface throughout the growing season. One should be able to at least dampen the bottom of his shoes when walking during September.

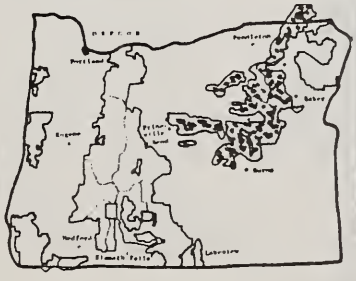
In general, the soil surface is too wet or moist to support livestock, thus trampling is a common problem when grazed.

Nebraska sedge dominant. Water in the stream is just below ground level - sedge roots have a high water table all year.

CHARACTERISTICS

	Herbage	Surface Rock	Erosion Pavement	Bare Ground	Moss
Mean	2200 lb				
5% level	600 lb				

RANGE CONDITION
(Decreasers:
Good: **80% cover or XX + plants**
Fair: **40 - 79% or XX - XX plants**
Poor: **5 - 39% or XX - XX plants**
V. Poor: **no decreasers**



Ovalhead sedge dominant.

QUAKING ASPEN MEADOW HQ-M1

(Populus tremuloides meadow) (10A)

Range Condition Guide: **R6-2210-C7**

ENVIRONMENT

Slope position: **bottom**
Aspect: **(any aspect - flat)**
% slope: **0-10**
Elevation: **1500 - 6500**
Topography: **undulating to steep**

SOILS

Geology: **alluvium**
Total depth: **24-64"**
Effective depth: **24-64"**
Stonyness: **0-40%**
Texture: **sandy loam to clay loam**
Structure: **moderate to strong**
Special: **soils subject to compaction when wet**

VEGETATION

Dominants	% Cover	Status
Quaking aspen	10-60	Climax dominant, decreaser
Tufted hairgrass	20-60	Decreaser
Ovalhead sedge	0-40	Decreaser, indicates wetter sites
California oatgrass	0-40	Decreaser, indicates drier sites
Kentucky bluegrass	0-40	Increaser
Bentgrass	10-40	Decreaser

This type is very limited in the Blue Mountains. It occurs on moist meadow sites often as small clumps or clones. In many areas, its distribution seems to have been limited by beaver activity. Where the crown cover is rather open, the subordinate vegetation should be evaluated with the moist meadow standards.

Good condition: Deschampsia caespitosa dominant with various amounts of sedges, Agrostis and Danthonia. Poa pratensis often becomes dominant as trend goes down. Finally, in poor and very poor condition, Veratrum (false Hellebore) and various weeds may dominate.

Moist meadows are wet to moist in the spring and are sub-irrigated or have freely available water within the rooting zone throughout the growing season. The soil surface dries sufficiently to support livestock without causing trampling damage prior to mid August.

Good condition aspen meadow with sedge and hairgrass dominant; moist meadow conditions.

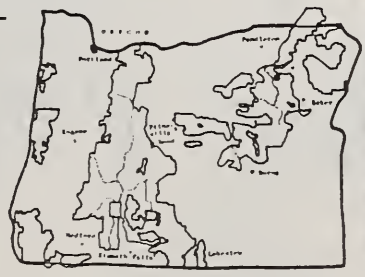
CHARACTERISTICS

	Herbage	Surface Rock	Erosion Pavement	Bare Ground	Moss
Mean	1400 lb				
5% level	400 lb				

RANGE CONDITION

(Decreasers:

Good: **80% cover or XX + plants**
Fair: **40-79% or XX - XX plants**
Poor: **2 - 39% or XX - XX plants**
V. Poor: **no decreasers**



QUAKING ASPEN MEADOW HQ-M1

Sandberg bluegrass

Poa sandbergii

onespike danthonia

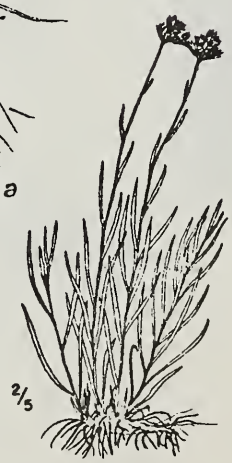
Danthonia unispicata

Biscuitroot

L. grayi

B. serrata

Balsamroot



A. stenophylla

Narrowleaf

pussytoes

BLUEGRASS SCABLAND GS-91-11 (Poa sandbergii scabland) (1S)

Range Condition Guide: **Shrub and non-shrub scablands. R6-2210-49.**

ENVIRONMENT

Slope position: **top to mid**
Aspect: **southerly**
% slope: **less than 20%**
Elevation: **4600 - 6200**
Topography: **undulating to rolling**

SOILS

Geology: **flow lavas**
Total depth: **4-8 (10)**
Effective depth: **3-6 (8)**
Stonyness: **20-40% (0)**
Texture: **loam, sandy loam**
Structure: **weak to mod. subangl.**
Special: **severe water saturation during the winter, severe frost heaving**

Ponderosa on scabland

VEGETATION

Dominants	% Cover	Status
Sandberg bluegrass	20-30	**Climax dominant, decreaser**
Onespike oatgrass	0-20	**Decreaser to icecream plant**
Bighead clover	0-20	**Decreaser, quick to increase**
Biscuitroots	2-6	**Increasers**
Pussytoes	1-5	**Increaser**
Balsamroot	2-8	**Increaser, palatable to game**

Good range condition looks very similar to poor condition bunchgrass range - vegetation is dominated by bluegrass with erosion (desert) pavement, some bare soil from frost boils, moss and some stone on the surface. Bedrock is generally uncracked which seems to prevent stiff sagebrush from colonizing the site

Poor condition is dominated by increasers with more bare soil, less moss, and often less "erosion pavement." The gravel pavement on the sites is the result of frost heaving and it is natural The gravel reduces wind erosion and prevents rain drops from puddling the soil surface

Revegetation is not possible

Indicators: lack of yarrow, presence of biscuitroots and some dwarf squirreltail, and lack of cheatgrass indicate scabland.

1½ dm. = 6 inches

CHARACTERISTICS

	Herbage	Surface Rock	Erosion Pavement	Bare Ground	Moss
Mean	160 lbs	23%	7 %	31%	22%
5% level	38 lbs	13%	12 %	14%	16%

RANGE CONDITION

(Decreasers: **bluegrass, oatgrass, clover**)

Good: **30% cover or 12+ plants**
Fair: **15 - 30% or 6 - 11 plants**
Poor: **5 - 15% or 1 - 5 plants**
V. Poor: **no decreasers**

BUNCHGRASS ON SHALLOW SOIL, GENTLE SLOPES GB-49-11

Achillea millefolium
Yarrow

Idaho fescue

Sandberg bluegrass

JRJ

Bluebunch wheatgrass

BUNCHGRASS ON SHALLOW SOIL, GENTLE SLOPES GB-49-11
(Agropyron-Festuca; shallow, flat) (1FS)
Range Condition Guide: **Agropyron-Festuca R6-2210-23**

Poor seeding, shallow soil

ENVIRONMENT
Slope position: **top to low**
Aspect: **all directions**
% slope : **less than 25%**
Elevation: **3500 - 5500**
Topography: **undulating to rolling**

SOILS
Geology: **basic, flow lavas**
Total depth: **8-14**
Effective depth: **6-10**
Stonyness: **35%**
Texture: **loam to silt loam**
Structure: **moderate blocky**
Special: **shallow, stony soil severely limits revegetation**

VEGETATION

Dominants	% Cover	Status
Wheatgrass	15-25	**Decreaser, southerly slopes**
Fescue	8-15	**Decreasers, northerly slopes**
Sandberg bluegrass	18-28	**Increaser, palatable to game**
Yarrow	1-5	**Poorest site for yarrow**

Fescue dominant, good cond.

Good condition ranges clearly dominated by wheatgrass and fescue with some bare ground and erosion pavement. This community is midway between scabland on very young, shallow soil and good bunchgrass on well developed soil. Lower limits are based upon enough soil to grow wheatgrass and/or fescue. Upper limits at 14 inches soil depth are set for revegetation - revegetation is generally quite successful on soils deeper than 14 inches.
Poor condition appears rather similar to scabland with bluegrass and often biscuitroots dominant. In addition, yarrow is an indicator on sites better than scabland as are needlegrass, and squirreltail.
Revegetation is very tenuous on reddish soils, reasonably possible on dark brown soils and intermediate on brownish soils.
Indicators: increasing surface stone and increasingly lighter and redder surface soil related to decreasing herbage production, decreasing cover of wheatgrass and fescue, increasing revegetation problems.

Wheatgrass, 20% slope

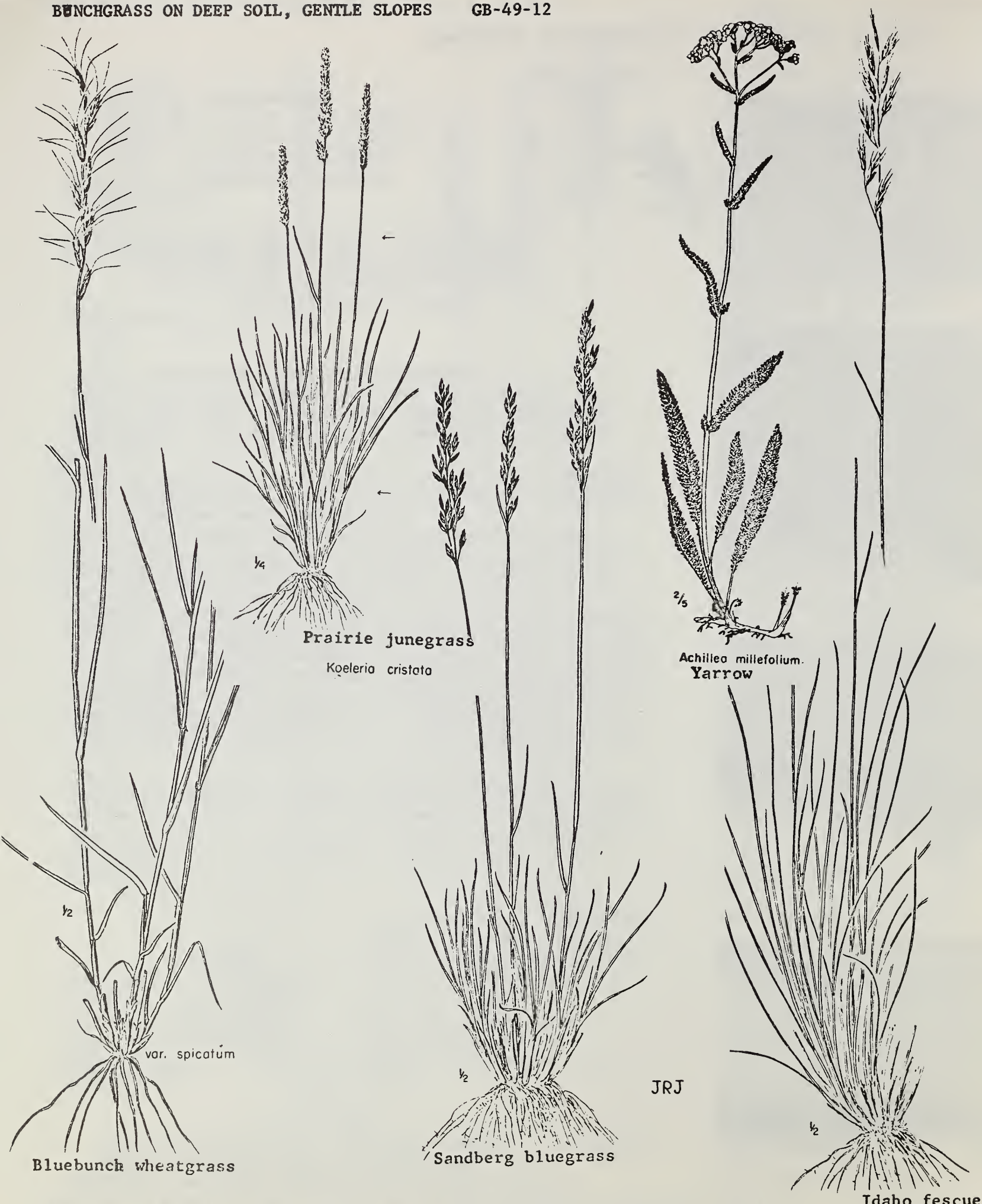
CHARACTERISTICS (9 plots)

	Herbage	Surface Rock	Erosion Pavement	Bare Ground	Moss
Mean	363 lbs	18%	5%	11%	15%
5% level	140 lbs	9%	3%	6%	10%

3½ dm. = 14 inches

RANGE CONDITION
(Decreasers: **wheatgrass, fescue**)
Good: **35% cover or 6+ plants**
Fair: **17 - 34% or 3 - 5 plants**
Poor: **2 - 16% or 1 - 2 plants**
V. Poor: **no decreasers**

BUNCHGRASS ON DEEP SOIL, GENTLE SLOPES GB-49-12



BUNCHGRASS ON DEEP SOIL, GENTLE SLOPES GB-49-12
(Agropyron-Festuca; deep, flat) (1FD)

Range Condition Guide: **Agropyron-Festuca, R6-2210-23**

Poor revegetation on shallo

ENVIRONMENT

Slope position: **top to mid**
Aspect: **all directions**
% slope: **less 25%**
Elevation: **3500-5000**
Topography: **undulating to rolling**

SOILS

Geology: **basic flow lava, loess**
Total depth: **15 to 45 inches**
Effective depth: **7-30 inches**
Stonyness: **12-40 (0) (60)**
Texture: **sandy loam to loam**
Structure: **moderate blocky**
Special: **best grassland soil**

VEGETATION

Dominants	% Cover	Status
Wheatgrass	**15-35**	**Decreaser, southerly slopes**
Fescue	**5-25**	**Decreaser, northerly slopes**
Sandberg bluegrass	**10-20**	**Increasers, palatable to game**
Prairie junegrass	**5-15**	**Suggests waterlogging in winter**
Yarrow	**1-6**	**Increaser, indicates good site**

Low site quality

Good condition clearly dominated by wheatgrass and/or fescue. Fescue tends to be more dominant on northerly slopes and on deeper soil.
Poor condition is often dominated by cheatgrass and bluegrass with yarrow, squirreltail and some needlegrass. Erosion pavement is generally sparce but bare ground greatly increases.
Revegetation is optimum of these sites; some problems may be encountered in shallower, reddish soils at the transition to shallow soil bunchgrass.
Indicators: dark brown to black soils are most productive; red to reddish light brown soils least productive; fescue increases with increasingly darker colored soils.

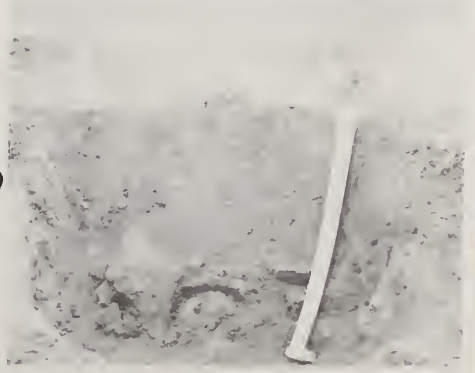
High site quality

CHARACTERISTICS

	Herbage	Surface Rock	Erosion Pavement	Bare Ground	Moss
Mean	679 lbs	7%	1%	11%	7%
5% level	250 lbs	9%	2%	6%	4%

RANGE CONDITION

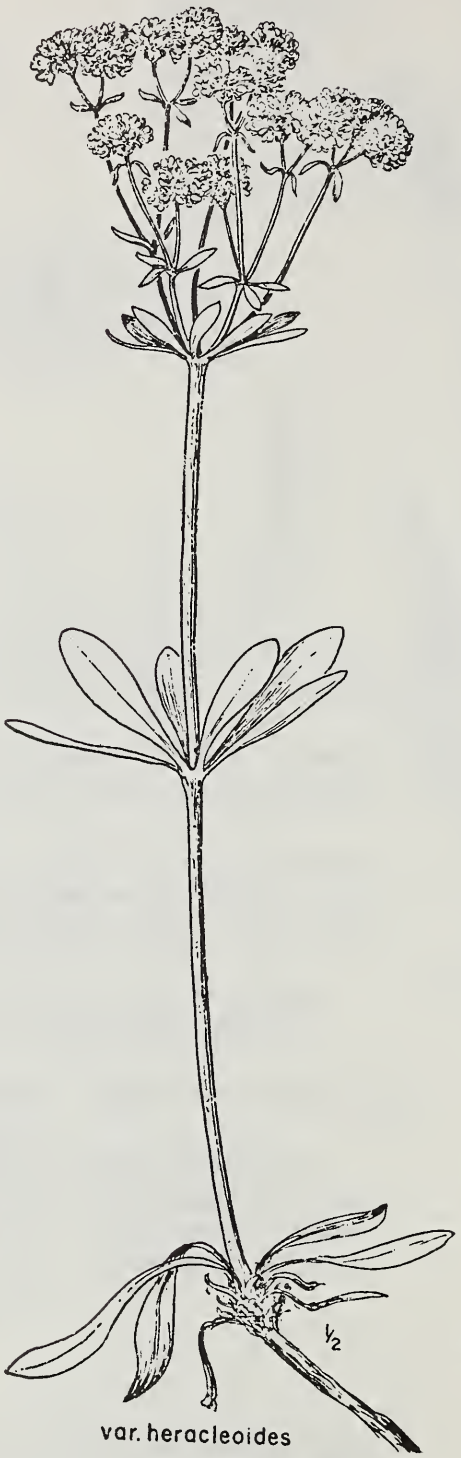
(Decreasers: **wheatgrass, fescue**
Good: **50% cover or 7+ plants**
Fair: **25 - 50% or 4 - 6 plants**
Poor: **2 - 25% or 1 - 3 plants**
V. Poor: **no decreasers**



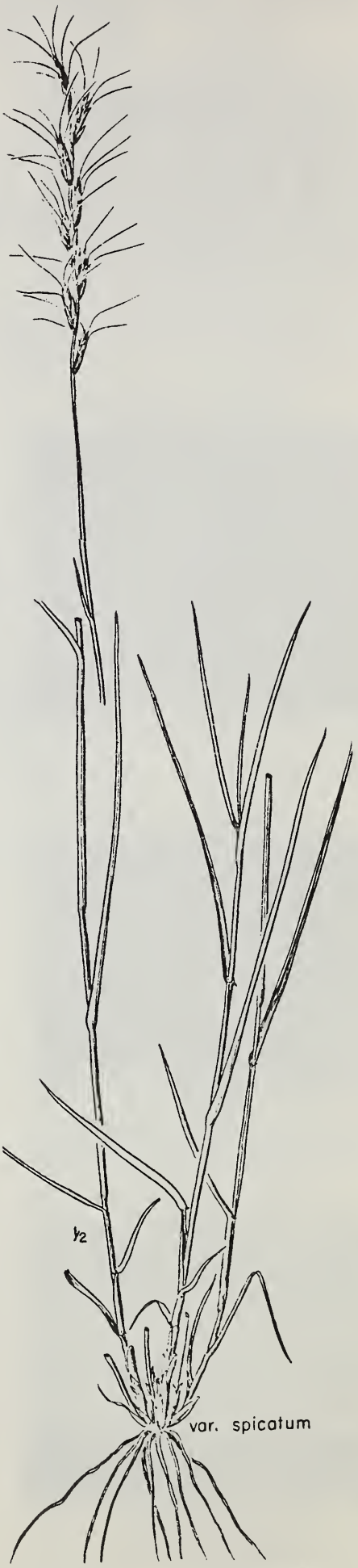
7 dm. = 28 inches

Achillea millefolium
Yarrow

Idaho fescue



var. heracleoides
Wyeth buckwheat



Bluebunch wheatgrass

BUNCHGRASS ON SHALLOW SOIL, STEEP SLOPES GB-49-13
(Agropyron-Festuca, shallow, steep) (1SS)

Range Condition Guide: Agropyron-Festuca R6-2210-23

Scattered mahogany

ENVIRONMENT
Slope position: upper to lower
Aspect: southerly (northerly)
% slope: greater 25% (71% ± 17)
Elevation: 3500-6000
Topography: steep to rough

SOILS
Geology: acid and basic lava
Total depth: 8-14 inches (10)
Effective Depth: 4-8 inches
Stonyness: 30-60% (80)
Texture: loamy sand to loam
Structure: weak to mod. blocky
Special: weak structure subject to dry ravel and displacement under animal traffic

VEGETATION

Dominants	% Cover	Status
Wheatgrass	10-35 (45)	Decreaser, southerly slopes
Fescue	0-20	Decreaser, northerly slopes
Sandberg bluegrass	3-10 (25)	Decreaser with elk, less on very steep slopes
Yarrow	0-7	Increaser
Wyeth buckwheat	0-5	Increaser

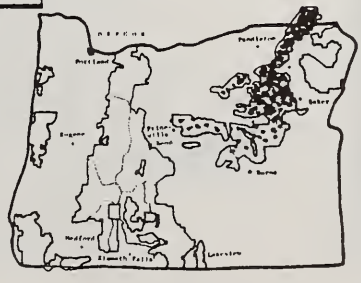
Low site quality

Good condition is dominated by wheatgrass with some codominance of fescue on northerly slopes and/or deeper soils. Medium to large rocks are common. Bluegrass decreases with increasing steepness of slope.
Poor condition is often dominated by rocks and erosion pavement with bluegrass and some cheatgrass. This is not a good cheatgrass site - lack of cheatgrass may indicate this shallow soil community in poor to very poor condition.
Revegetation is not possible due to steepness of slopes and shallow soils.
These sites are between tallus slopes and deep soil bunchgrass sites on steep slopes. Vegetation dominance varies with soil depth. Primary use of these areas is by deer and elk. They generally should not be grazed by cattle; well controlled sheep use may be permissable
Indicators: Increasing elevation, increasing % slopes, change from south to north aspect related to increasing fescue, decreasing wheatgrass, decreasing bluegrass. Herbage production decreases with elevation, increases with southerly aspect and concave microtopography.

Good site quality

CHARACTERISTICS (8 plots)

	Herbage	Surface	Erosion Pavement	Bare Ground	Moss
Mean	300 lbs	40%	10%	13%	2%
5% level	96 lbs	14%	8%	10%	2%



3½ dm. = 14 inches

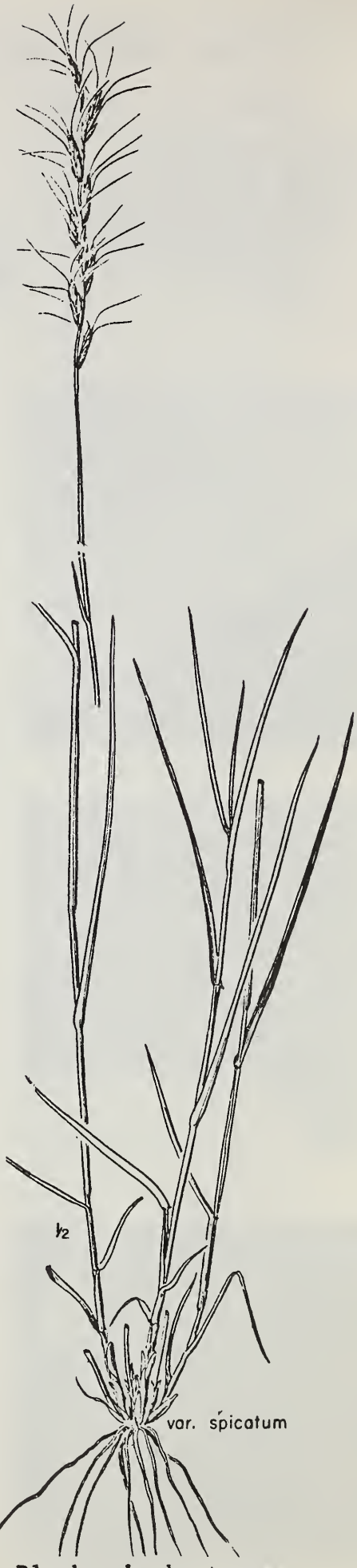
RANGE CONDITION
(Decreasers: wheatgrass, fescue, bluegrass
Good: 35% cover or 10+ plants
Fair: 17-34% or 5 - 9 plants
Poor: 2-33% or 1 - 4 plants
V. Poor: no decreasers

BUNCHGRASS ON DEEP SOIL, STEEP SLOPES GB-49-14

Achillea millefolium
Yarrow

Idaho fescue

var. heracleoides
Wyeth buckwheat



Bluebunch wheatgrass

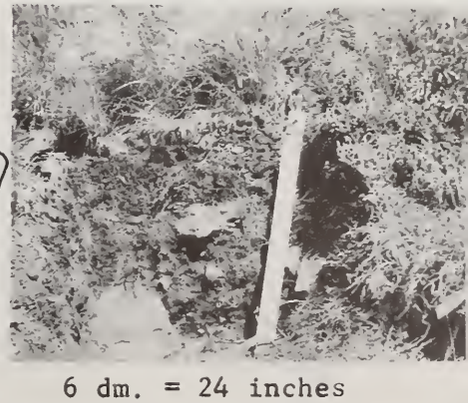
BUNCHGRASS ON DEEP SOIL, STEEP SLOPES GB-49-14
(Agropyron-Festuca, deep, steep) (1SD)

Range Condition Guide: Agropyron-Festuca R6-2210-23

Low site quality

Good site, south slope

Good site, north slope



6 dm. = 24 inches

ENVIRONMENT

Slope position: upper to lower
Aspect: southerly (northerly)
% slope: greater 25% (73% ± 13)
Elevation: 3000 - 6200
Topography: steep to rough

SOILS

Geology: basic & acid lava, loess
Total depth: 20 - 30 (14-45)
Effective depth: 10-20 (30)
Stonyness: 25-50 (0-70)
Texture: loamy sand to silt loam
Structure: weak to strong blocky
Special: Weak structure subject to dry ravel and displacement under animal traffic

VEGETATION

Dominants	% Cover	Status
Wheatgrass	15- 35 (65)	Decreaser, southerly slopes
Fescue	0-20 (75)	Decreaser, northerly slopes
Sandberg bluegrass	2-8 (20)	Increaser palatable to game
Yarrow	2-5	Increaser
Wyeth buckwheat	0-8 (20)	Increaser

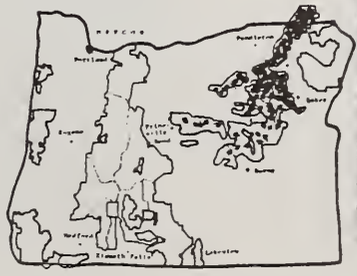
Good condition is dominated by wheatgrass and/or fescue. Bluegrass decreases with increasing steepness of slope.
Poor condition is generally dominated by cheatgrass with little bluegrass (apparently due to game use during winter). Needlegrass and squirreltail may be present. Yarrow tends to indicate a rather good grassland site.
Revegetation is not possible generally due to steep slopes; soil depth is suitable for special revegetation projects desired for erosion control.
Indicators: Increasing elevation, increasing % slope, change from south to north aspect related to increasing fescue, decreasing wheatgrass, decreasing bluegrass. Herbage production decreases with elevation, increases with southerly aspect and concave microtopography.

CHARACTERISTICS

	Herbage	Surface Rock	Erosion Pavement	Bare Ground	Moss
Mean	434 lbs	21%	5%	19%	4%
5% level	54 lbs	7%	3%	9%	3%

RANGE CONDITION

(Decreasers: wheatgrass, fescue, bluegrass
Good: 50% cover or 10+ plants
Fair: 25-49% or 5 - 9 plants
Poor: 2-24% or 1 - 4 plants
V. Poor: no decreasers

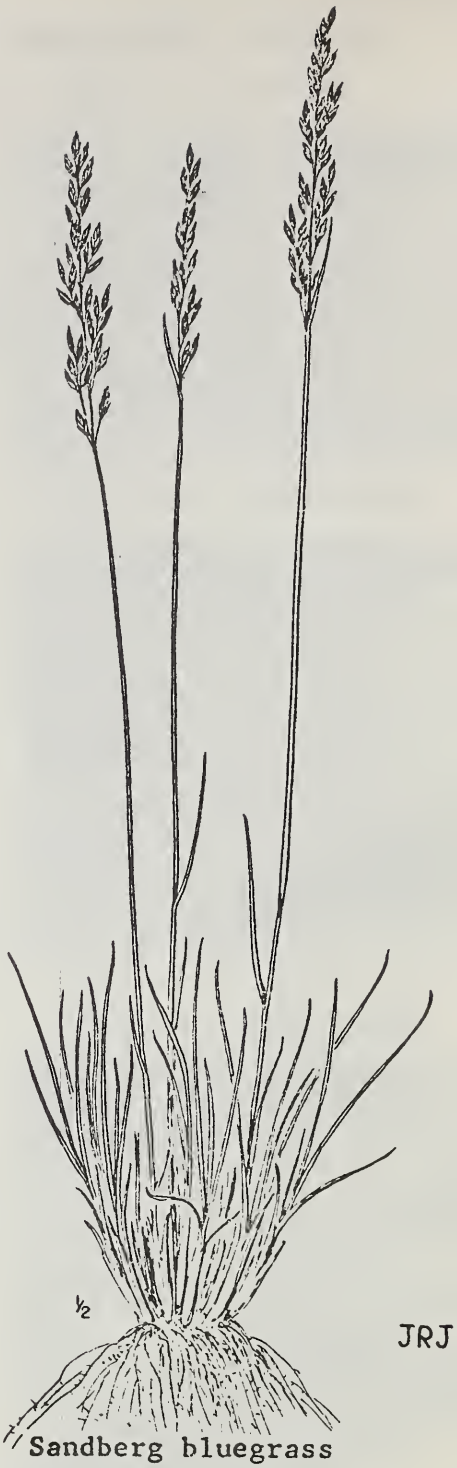


A. rigida
Stiff Sagebrush

False agoseris

Dwarf squirreltail

JRJ



Sandberg bluegrass
Poa sandbergii

JRJ

Biscuitroot
L. grayi

Bighead clover
T. macrocephalum

STIFF SAGE SCABLAND SD-91-11
(Artemisia rigida-Poa sandbergii scabland) (4R)

Range Condition Guide: **Shrub and non-shrub scabland R6-2210-49**

ENVIRONMENT

Slope position: **top to low**
Aspect: **southerly (northerly)**
% slope: **0-20 (40)**
Elevation: **3500-5500 (6000)**
Topography: **undulating-rolling**

SOILS

Geology: **basic and acid lavas**
Total depth: **4-10 inches (3)**
Effective depth: **3-7 inches**
Stonyness: **25-60% (0)**
Texture: **loams (clay loam)**
Structure: **weak to moderate**
Special: **severe moisture saturation during winter; severe frost heaving**

VEGETATION

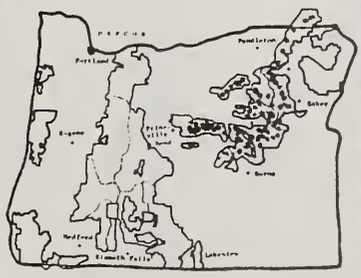
Dominants	% Cover	Status
Stiff sagebrush	**5-20**	**Decreaser, deciduous, palatable**
Sandberg bluegrass	**10-25(35)**	**Decreaser**
Wheatgrass	**0-20**	**Decreaser, on deeper soils**
Dwarf squirreltail	**0-7**	**Increaser/decreaser**
Bighead clover	**0-10(20)**	**Decreaser, first to increase**

Good condition looks like poor condition big sagebrush due to general lack of vegetation. Stiff sage and bluegrass dominate with moss occupying most of the ground between "erosion" pavement (desert pavement) and rocks.
Poor condition: sage is widely spaced, well hedged and few young plants will be present. Bluegrass is very sparce, clover absent, and biscuitroots common. Bare soil will be increasingly present; frost boils common.
Revegetation: Seeding is not possible due to shallow soils and water logging during the winter which are inimical to domestic grasses. Sage should **NOT be sprayed** because it is palatable to game animals as well as livestock and because it reduces wind speed over the soil surface.
Indicators: "Erosion pavement" is natural and desirable since it prevents wind erosion and reduces raindrop puddling. From south to north: sage cover decreases and bluegrass cover increases. Change from south to north aspect and increasing % slope: wheatgrass cover and herbage production increase.

CHARACTERISTICS (24 plots)

	Herbage	Surface Rock	Erosion Pavement	Bare Ground	Moss
Mean	207 lbs	22%	18%	20%	8%
5% level	54 lbs	5%	5%	5%	2%

RANGE CONDITION (Decreasers: sagebrush, bluegrass, clover, wheatgrass)
Good: 40% cover or 12 + plants
Fair: 20 - 39% or 6 - 11 plants
Poor: 2 - 19% or 1 - 5 plants
V. Poor: no decreasers

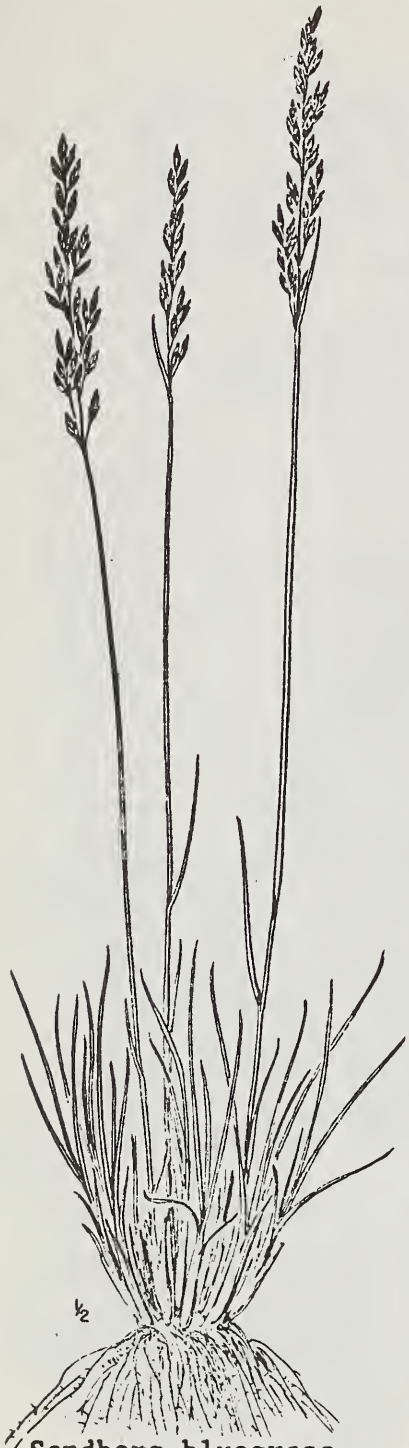



Ponderosa on scabland


Best site with wheatgrass


Average site, gravel cover

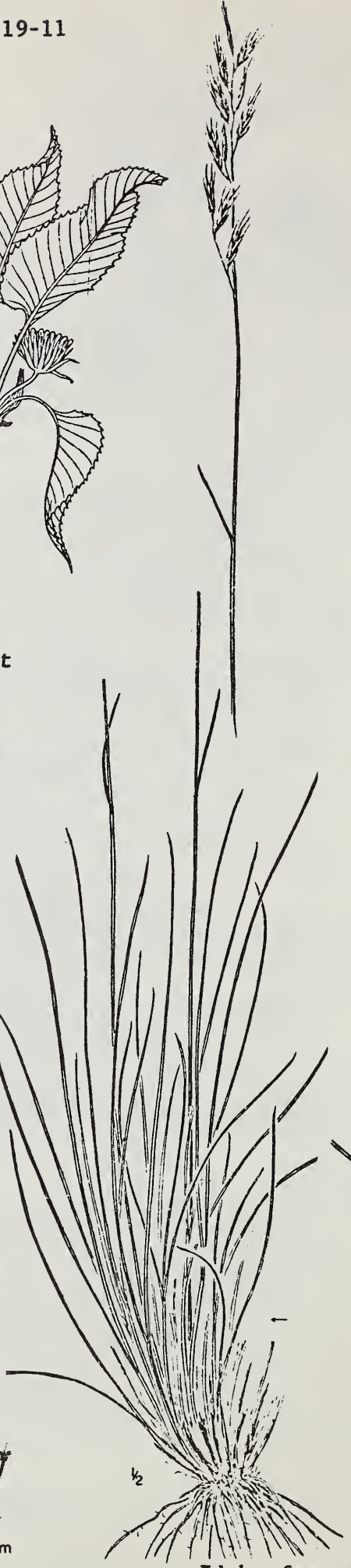

1½ dm. = 6 inches



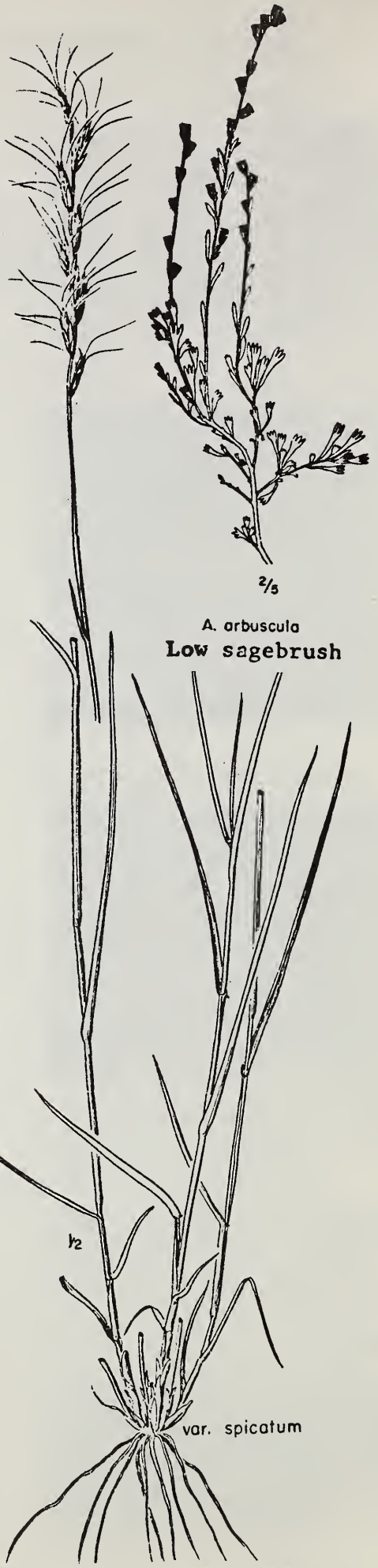
Sandberg bluegrass

B. serrata
Balsamroot

Achillea millefolium
Yarrow



Idaho fescue



A. arbuscula
Low sagebrush

Bluebunch wheatgrass

LOW SAGEBRUSH - BUNCHGRASS SD-19-11
(Artemisia arbuscula-Agropyron-Festuca) (4A)

Range Condition Guide: Artemisia-Agropyron-Festuca
R6-2210-52

Fescue dominant

ENVIRONMENT

Slope position: mid to top (low)
Aspect: all aspects
% slope: 2 - 15 (40)
Elevation: 4000-5800 (6200)
Topography: undulating - rolling

SOILS

Geology: basic & acid lavas
Total depth: 10-25 inches
Effective depth: 4-20 inches(27)
Stonyness: 15-50% (0) (70)
Texture: sandy loam-loam (clay lm)
Structure: weak to moderate
Special: some winter moisture saturation; soil subject to trampling damage early spring

VEGETATION

Dominants	% Cover	Status
Low sagebrush	7-22 (2)	Increaser, climax shrub
Wheatgrass	0-50	Decreaser
Fescue	0-40	Decreaser
Sandberg bluegrass	4-20 (28)	Increaser
Yarrow	0-5	Increaser, better sites

Poor site, wheatgrass

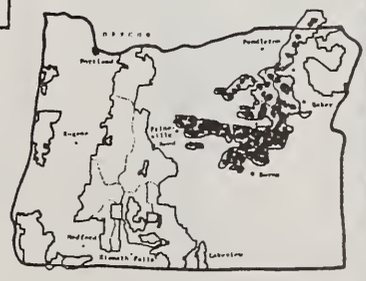
Good condition: Wheatgrass and/or fescue tend to cover and hide the sage giving an impression of pure grassland. Low sage is an indicator of poor sagebrush sites; it is part of climax.
Poor condition: Sagebrush is dominant with bluegrass and a thin stand of cheatgrass. Soil surface is often partly covered by "erosion pavement."
Revegetation: Seeding domestic grasses is tenuous except on deeper soil and soil of dark brown to black surface color. Avoid seeding in red or reddish brown soils with abundant surface rock. Sagebrush is often palatable to game animals during the winter It can be sprayed for release of grass in range condition of fair or good - do not spray in poor or very poor condition.
Indicators: Change from south to north aspect and increasing elevation related to: decreasing wheatgrass, decreasing herbage production, increasing fescue. Lower slope position and concave microtopography related to decreasing sagebrush cover and increasing bluegrass cover.

Good site, wheatgrass

CHARACTERISTICS (22 plots)

	Herbage	Surface Rock	Erosion Pavement	Bare Ground	Moss
Mean	411 lbs	13%	10%	16%	5%
5% level	53 lbs	5%	5%	5%	3%

RANGE CONDITION
(Decreasers: wheatgrass, fescue)
Good: 40% cover or 6 + plants
Fair: 20-39% or 3 - 5 plants
Poor: 2 - 19% or 1 - 2 plants
V. Poor: no decreasers

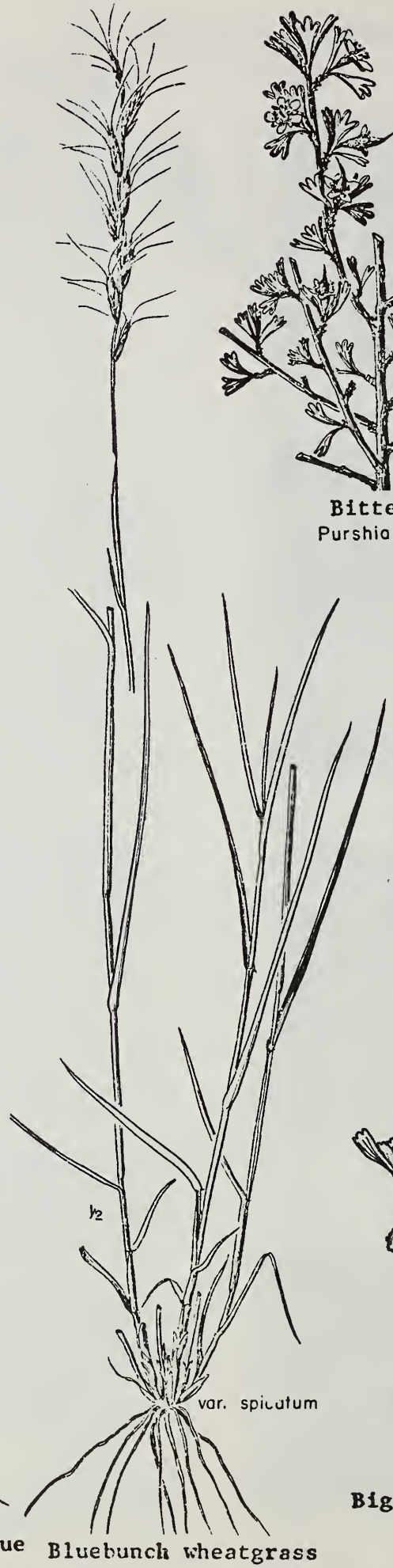


4 dm. = 16 inches

LOW SAGEBRUSH - BUNCHGRASS SD-19-11

Sandberg bluegrass

Idaho fescue



Bluebunch wheatgrass

Bitterbrush
Purshia tridentata

A. tridentata
Big Sagebrush

BIG SAGEBRUSH - BUNCHGRASS SD-29-11
(Artemisia tridentata-Agropyron-Festuca) (4T)

Range Condition Guide: Artemisia-Agropyron-Festuca
R6-2210-52

ENVIRONMENT
Slope position: low to top
Aspect: all
% slope: 5-30 (60)
Elevation: 3500 - 5800
Topography: rolling to steep (undulating)

SOILS
Geology: lavas, sedimentary granitic
Total depth: 24-48 inches (60)
Effective depth: 18-30 (45)
Stonyness: 15-55% (0)
Texture: sandy loam-loam(Clay 1)
Structure: weak to moderate
Special: granitic soil subject to dry ravel and movement under livestock on slopes

VEGETATION

Dominants	% Cover	Status
Big sagebrush	4-15 (26)	Climax shrub, increaser
Wheatgrass	5-45	Decreaser, southerly slopes
Fescue	0-40	Decreaser, northerly slopes
Sandberg bluegrass	5-14	Increaser, palatable to game
Prairie junegrass	1-8 (20)	Increaser/decreaser

Fescue on poor site

Fescue on good site

Good condition: bunchgrasses clearly dominant with only occasional sagebrush evident (most hidden by grasses). Some bitterbrush may be present. Yarrow indicates a good site.
Poor condition: dominance by sagebrush with cheatgrass and bluegrass Density of cheatgrass tends to indicate site quality.
Revegetation: on slopes less than 25%, sagebrush control and seeding with domestic grasses is generally quite successful Sagebrush furnishes some winter forage for game animals, therefore complete control by chemicals or fire is not always desirable. Bitterbrush should be avoided in brush control.
Indicators: Change from south to north aspect - wheatgrass decreases and fescue increases, herbage production decreases

Wheatgrass on good site

CHARACTERISTICS (15 plots)

	Herbage	Surface Rock	Erosion Pavement	Bare Ground	Moss
Mean	412 lbs	5%	11%	10%	0%
5% level	57 lbs	5%	6%	3%	0%

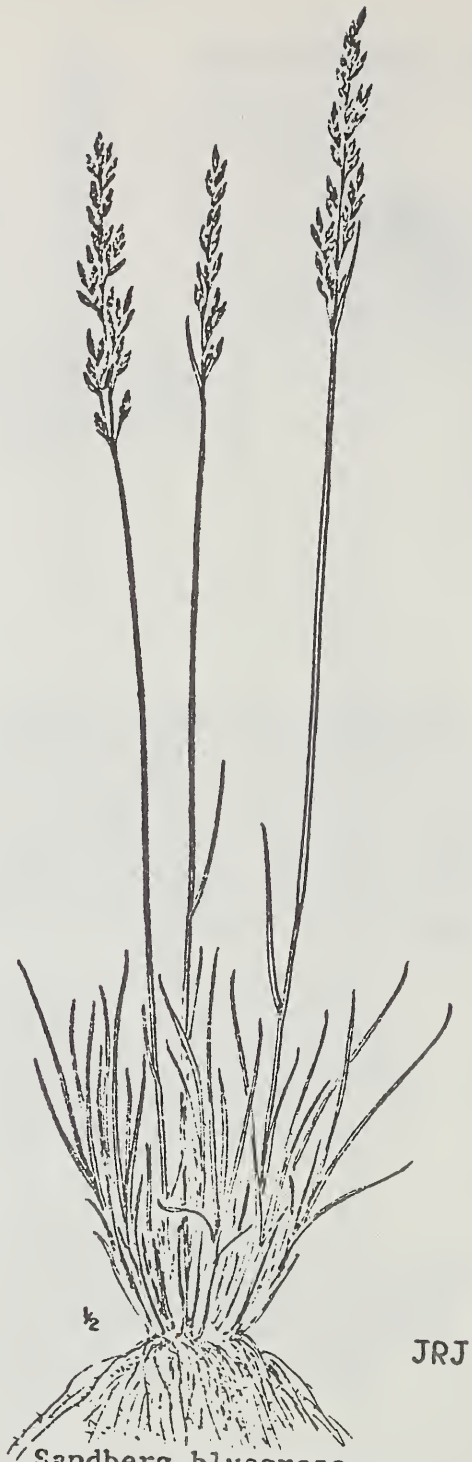
RANGE CONDITION
(Decreasers: wheatgrass, fescue)
Good: 50% cover or 8 + plants
Fair: 25-49% or 4 - 7 plants
Poor: 2-24% or 1 - 3 plants
V. Poor: no decreasers

7½ dm. = 30 inches

BIG SAGEBRUSH - BUNCHGRASS SD-29-11

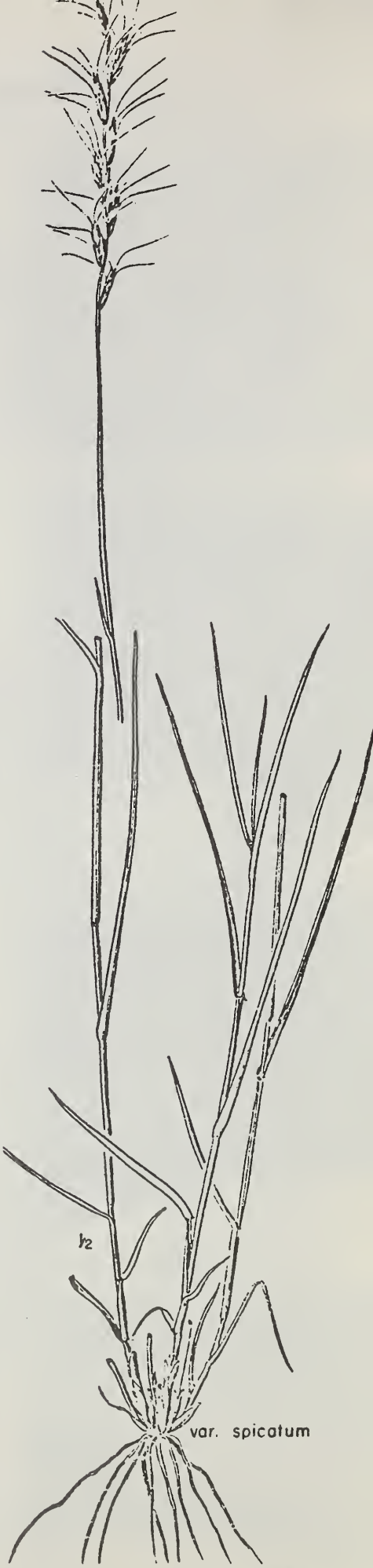
Achillea millefolium
Yarrow

Idaho fescue



Sandberg bluegrass

JRJ



Bluebunch wheatgrass

JUNIPER - BUNCHGRASS CJ-G1-11
(Juniperus occidentalis - Agropyron - Festuca) (9B)

Range Condition Guide: **Agropyron-Festuca R6-2210-23**

Poor condition - cheatgrass

ENVIRONMENT

Slope position: top to low
Aspect: all directions
% slope : less than 25%
Elevation: 3500 - 5500
Topography: undulating to rolling

SOILS

Geology: basic, flow lavas
Total depth: 8-14
Effective depth: 6-10
Stonyness: 35%
Texture: loam to silt loam
Structure: moderate blocky
Special: shallow, stony soil severely limits revegetation

Juniper with ponderosa

VEGETATION

Dominants	% Cover	Status
Wheatgrass	15-25	Decreaser, southerly slopes
Fescue	8-15	Decreasers, northerly slopes
Sandberg bluegrass	18-28	Increaser, palatable to game
Yarrow	1-5	Poorest site for yarrow
Juniper	2 or more per acre	

Good condition ranges clearly dominated by wheatgrass and fescue with some bare ground and erosion pavement. This community is midway between scabland on very young, shallow soil and good bunchgrass on well developed soil. Lower limits are based upon enough soil to grow wheatgrass and/or fescue. Upper limits at 14 inches soil depth are set for revegetation - revegetation is generally quite successful on soils deeper than 14 inches.

Poor condition appears rather similar to scabland with bluegrass and often biscuitroots dominant. In addition, yarrow is an indicator on sites better than scabland as are needlegrass, and squirreltail.

Revegetation is very tenuous on reddish soils, reasonably possible on dark brown soils and intermediate on brownish soils.

Indicators: increasing surface stone and increasingly lighter and redder surface soil related to decreasing herbage production, decreasing cover of wheatgrass and fescue, increasing revegetation problems.

Wheatgrass, scattered trees

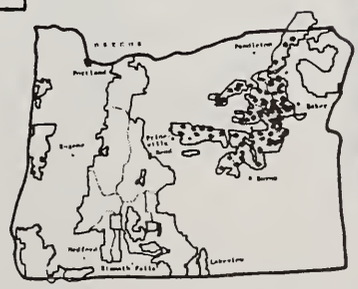
CHARACTERISTICS (9 plots)

	Herbage	Surface Rock	Erosion Pavement	Bare Ground	Moss
Mean	363 lbs	18%	5%	11%	15%
5% level	140 lbs	9%	3%	6%	10%

5 dm. = 20 inches

RANGE CONDITION

(Decreasers: wheatgrass, fescue)
Good: 35% cover or 6+ plants
Fair: 17 - 34% or 3 - 5 plants
Poor: 2 - 16% or 1 - 2 plants
V. Poor: no decreasers



JUNIPER - BUNCHGRASS CJ-G1-11

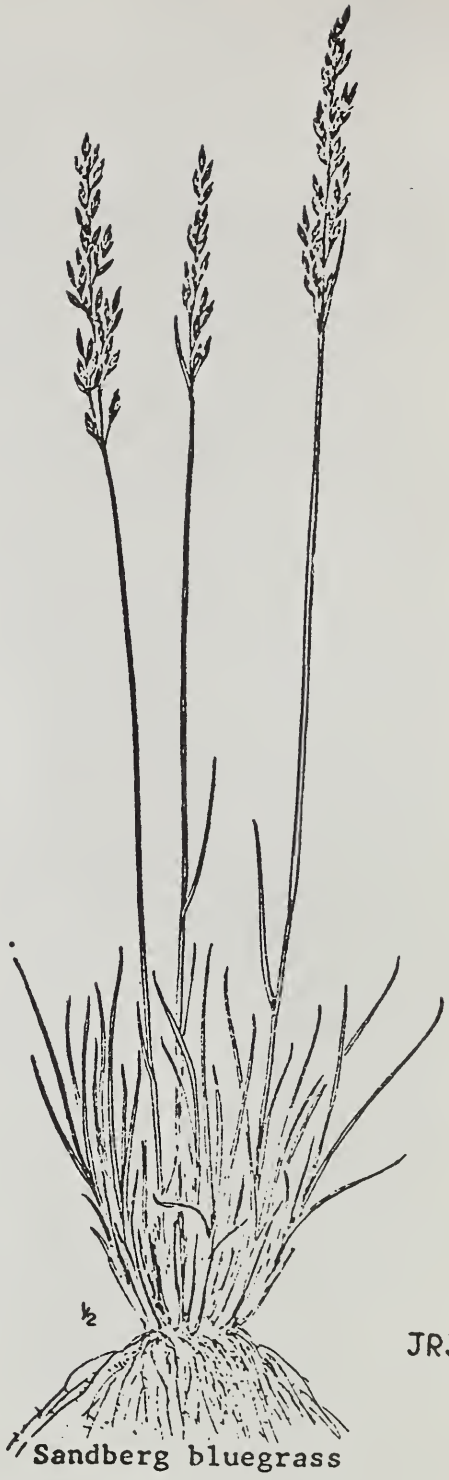
JUNIPER - STIFF SAGE SCABLAND CJ-S8-11

A. rigida
Stiff Sagebrush

False agoseris

Dwarf squirreltail

JRJ



Sandberg bluegrass
Poa sandbergii

JRJ

Biscuitroot
L. grayi

Bighead clover
T. macrocephalum

JUNIPER STIFF SAGE SCABLAND CJ-S8-11
(Juniperus occidentalis - Artemisia rigida scabland) (9R)

Range Condition Guide: **Shrub and non-shrub scabland R6-2210-49**

ENVIRONMENT

Slope position: top to low
Aspect: southerly (northerly)
% slope: 0-20 (40)
Elevation: 3500-5500 (6000)
Topography: undulating-rolling

SOILS

Geology: basic and acid lavas
Total depth: 4-10 inches (3)
Effective depth: 3-7 inches
Stonyness: 25-60% (0)
Texture: loams (clay loam)
Structure: weak to moderate
Special: severe moisture saturation during winter; severe frost heaving

VEGETATION

Dominants	% Cover	Status
Stiff sagebrush	5-20	Decreaser, deciduous, palatable
Sandberg bluegrass	10-25(35)	Decreaser
Wheatgrass	0-20	Decreaser, on deeper soils
Dwarf squirreltail	0-7	Increaser/decreaser
Bighead clover	0-10(20)	Decreaser, first to increase
Juniper	2 or more per acre	

Good condition looks like poor condition big sagebrush due to general lack of vegetation. Stiff sage and bluegrass dominate with moss occupying most of the ground between "erosion" pavement (desert pavement) and rocks.

Poor condition: sage is widely spaced, well hedged and few young plants will be present. Bluegrass is very sparce, clover absent, and biscuitroots common. Bare soil will be increasingly present; frost boils common.

Revegetation: Seeding is not possible due to shallow soils and water logging during the winter which are inimical to domestic grasses. Sage should NOT be sprayed because it is palatable to game animals as well as livestock and because it reduces wind speed over the soil surface.

Indicators: "Erosion pavement" is natural and desirable since it prevents wind erosion and reduces raindrop puddling. From south to north: sage cover decreases and bluegrass cover increases. Change from south to north aspect and increasing % slope: wheatgrass cover and herbage production increase.

Good site with some wheatgrass

CHARACTERISTICS (24 plots)

	Herbage	Surface Rock	Erosion Pavement	Bare Ground	Moss
Mean	207 lbs	22%	18%	20%	8%
5% level	54 lbs	5%	5%	5%	2%

RANGE CONDITION (Decreasers: sagebrush, bluegrass, clover, wheatgrass)

Good: 40% cover or 12 + plants
Fair: 20 - 39% or 6 - 11 plants
Poor: 2 - 19% or 1 - 5 plants
V. Poor: no decreasers

1½ dm. = 6 inches

JUNIPER - STIFF SAGE SCABLAND CJ-S8-11

JUNIPER - LOW SAGEBRUSH CJ-S1-11

JUNIPER - LOW SAGEBRUSH SJ-S1-11
(Juniperus occidentalis - Artemisia arbuscula) (9A)

Range Condition Guide: Artemisia-Agropyron-Festuca
R6-2210-52

ENVIRONMENT

Slope position: mid to top (low)
Aspect: all aspects
% slope: 2 - 15 (40)
Elevation: 4000-5800 (6200)
Topography: undulating - rolling

SOILS

Geology: basic & acid lavas
Total depth: 10-25 inches
Effective depth: 4-20 inches(27)
Stonyness: 15-50% (0) (70)
Texture: sandy loam-loam (clay lm)
Structure: weak to moderate
Special: some winter moisture saturation; soil subject to trampling damage early spring

VEGETATION

Dominants	% Cover	Status
Low sagebrush	7-22 (2)	Increaser, climax shrub
Wheatgrass	0-50	Decreaser
Fescue	0-40	Decreaser
Sandberg bluegrass	4-20 (28)	Increaser
Yarrow	0-5	Increaser, better sites
Juniper	2 or more per acre	

Good condition: Wheatgrass and/or fescue tend to cover and hide the sage giving an impression of pure grassland. Low sage is an indicator of poor sagebrush sites; it is part of climax.
Poor condition: Sagebrush is dominant with bluegrass and a thin stand of cheatgrass. Soil surface is often partly covered by "erosion pavement."
Revegetation: Seeding domestic grasses is tenuous except on deeper soil and soil of dark brown to black surface color. Avoid seeding in red or reddish brown soils with abundant surface rock. Sagebrush is often palatable to game animals during the winter It can be sprayed for release of grass in range condition of fair or good - do not spray in poor or very poor condition.
Indicators: Change from south to north aspect and increasing elevation related to: decreasing wheatgrass, decreasing herbage production, increasing fescue. Lower slope position and concave microtopography related to decreasing sagebrush cover and increasing bluegrass cover.

Poor condition - bluegrass

Good condition - wheatgrass

CHARACTERISTICS (22 plots)

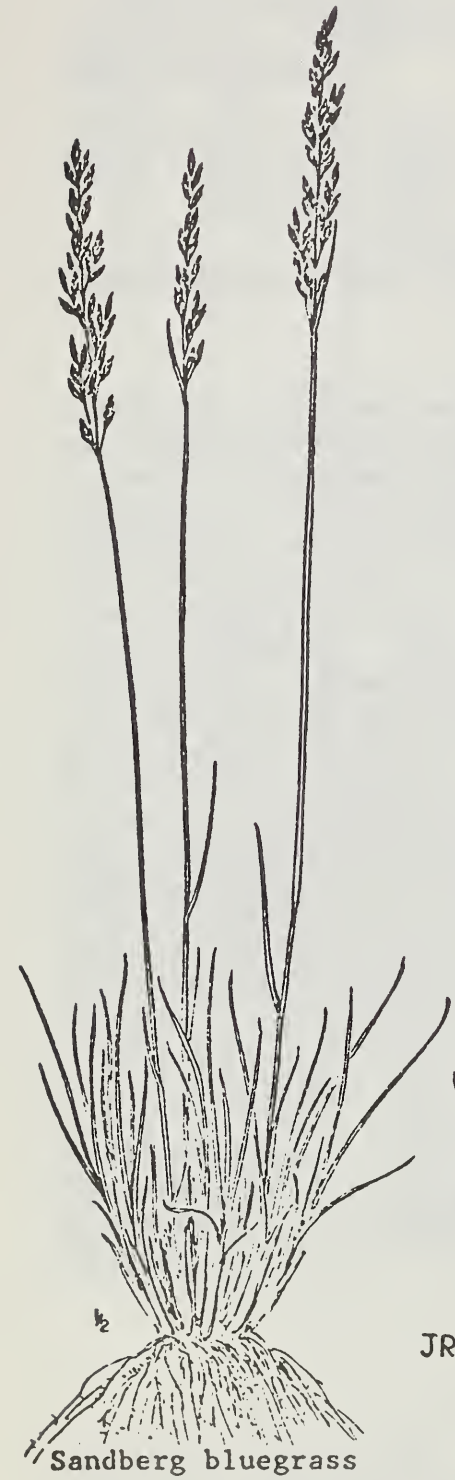
	Herbage	Surface Rock	Erosion Pavement	Bare Ground	Moss
Mean	411 lbs	13%	10%	16%	5%
5% level	53 lbs	5%	5%	5%	3%

RANGE CONDITION

(Decreasers: wheatgrass, fescue)
Good: 40% cover or 6 + plants
Fair: 20-39% or 3 - 5 plants
Poor: 2 - 19% or 1 - 2 plants
V. Poor: no decreasers

3 dm. = 12 inches

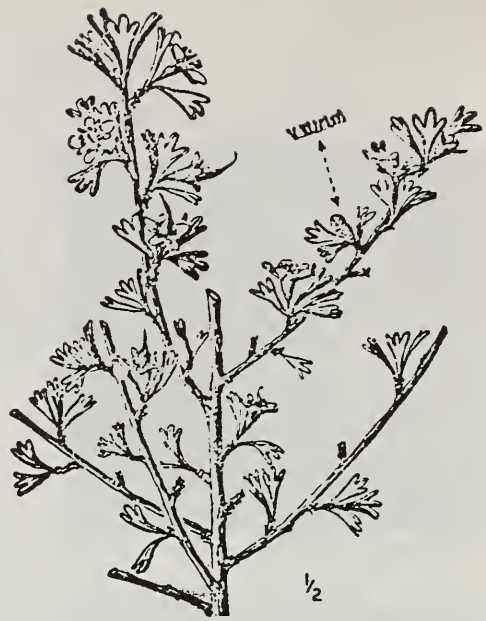
JUNIPER - LOW SAGEBRUSH CJ-S1-11



Sandberg bluegrass

Idaho fescue

Bluebunch wheatgrass



Bitterbrush
Purshia tridentata

A. tridentata
Big Sagebrush

JUNIPER BIG SAGEBRUSH CJ-S2-11
(Juniperus occidentalis - Artemisia tridentata) (9T)

Range Condition Guide: Artemisia-Agropyron-Festuca
R6-2210-52

ENVIRONMENT
Slope position: low to top
Aspect: all
% slope: 5-30 (60)
Elevation: 3500 - 5800
Topography: rolling to steep (undulating)

SOILS
Geology: lavas, sedimentary granitic
Total depth: 24-28 inches (60)
Effective depth: 18-30 (45)
Stonyness: 15-55%
Texture: sandy loam-loam(Clay 1)
Structure: weak to moderate
Special: granitic soil subject to dry ravel and movement under livestock on slopes

VEGETATION

Dominants	% Cover	Status
Big sagebrush	4-15 (26)	Climax shrub, increaser
Wheatgrass	5-45	Decreaser, southerly slopes
Fescue	0-40	Decreaser, northerly slopes
Sandberg bluegrass	5-14	Increaser, palatable to game
Prairie junegrass	1-8 (20)	Increaser/decreaser
Juniper	2 or more per acre	(Increaser)

Young juniper, sparce sage

Good condition: bunchgrasses clearly dominant with only occasional sagebrush evident (most hidden by grasses). Some bitterbrush may be present. Yarrow indicates a good site.
Poor condition: dominance by sagebrush with cheatgrass and bluegrass Density of cheatgrass tends to indicate site quality.
Revegetation: on slopes less than 25%, sagebrush control and seeding with domestic grasses is generally quite successful. Sagebrush furnishes some winter forage for game animals, therefore complete control by chemicals or fire is not always desirable. Bitterbrush should be avoided in brush control.
Indicators: Change from south to north aspect - wheatgrass decreases and fescue increases, herbage production decreases.

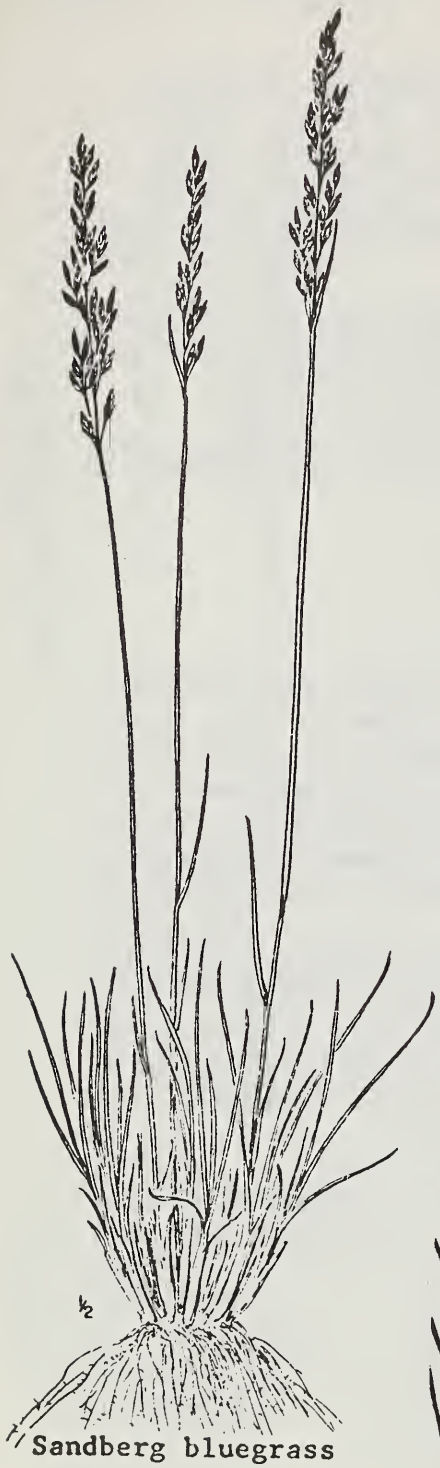
7 dm. = 28 inches

CHARACTERISTICS (15 plots)

	Herbage	Surface Rock	Erosion Pavement	Bare Ground	Moss
Mean	412 lbs	5%	11%	10%	0%
5% level	57 lbs	5%	6%	3%	0%

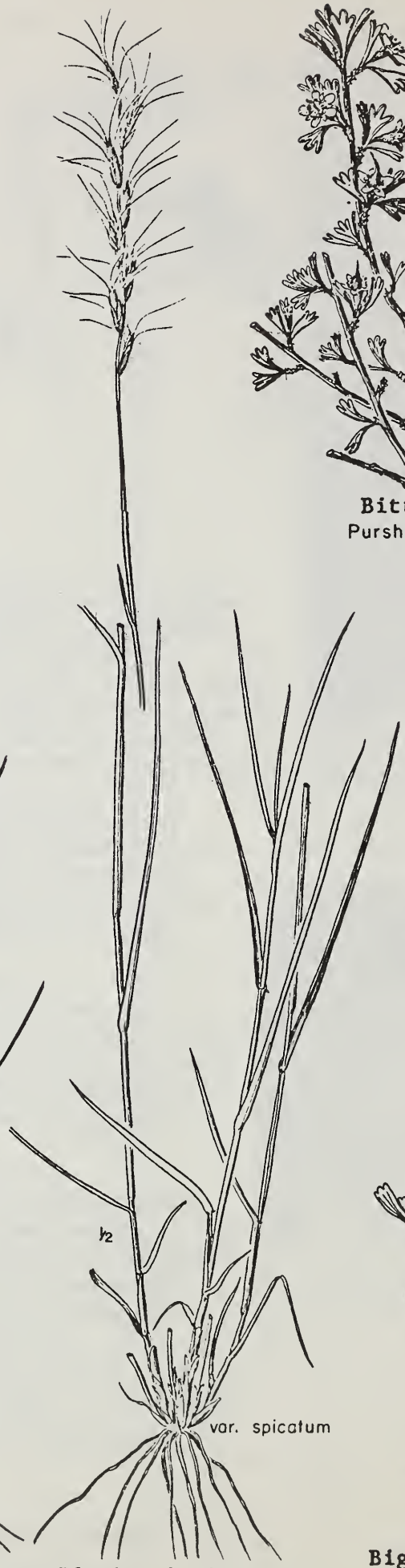
RANGE CONDITION
(Decreasers: wheatgrass, fescue)
Good: 50% cover or 8 + plants
Fair: 25-49% or 4 - 7 plants
Poor: 2-24% or 1 - 3 plants
V. Poor: no decreasers

JUNIPER - BIG SAGEBRUSH CJ-S2-11

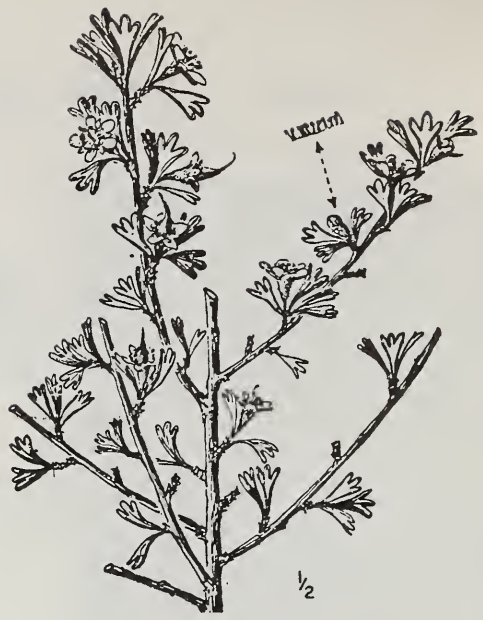


Sandberg bluegrass

Idaho fescue



Bluebunch wheatgrass



Bitterbrush
Purshia tridentata

A. tridentata
Big Sagebrush

BITTERBRUSH - BUNCHGRASS SD-39
(Purshia tridentata-Agrophyron-Festuca) (5P)

Range Condition Guide: Agropyron-Festuca R6-2210-23

ENVIRONMENT
Slope position: low to top
Aspect: southerly (northerly)
% slope: 5-30 (60)
Elevation: 3500-5000
Topography: rolling to steep

SOILS
Geology: lavas, sedimentary, granitics
Total depth: 24-48 inches
Effective depth: 15-30 inches
Stonyness: 15-60%
Texture: sandy loams to loams
Structure: weak to moderate
Special: Granitic soils subject to dry ravel and displacement under livestock.

VEGETATION

Dominants	% Cover	Status
Bitterbrush	5-20	Climax, decreaser
Wheatgrass	5-45	Decreaser, southerly slopes
Fescue	0-40	Decreaser, northerly slopes
Sandberg bluegrass	5-14	Increaser, palatable to game
Big sagebrush	0-10	Increaser, climax, drier sites

Good condition: Bitterbrush not suffering from serious hedging, some young plants; bunchgrasses clearly dominate under shrubs; sagebrush dominance is related to drier sites - up to 10% crown cover.

Poor condition: bitterbrush severely hedged, dying with no young plants; ground dominated by cheatgrass and bluegrass, sagebrush may be increasing (some to many young plants). To qualify for the BITTERBRUSH-BUNCHGRASS type, bittergrush plants must be no more than 30 feet apart (between live or dead plants), otherwise, the site would qualify for BIG SAGEBRUSH-BUNCHGRASS.

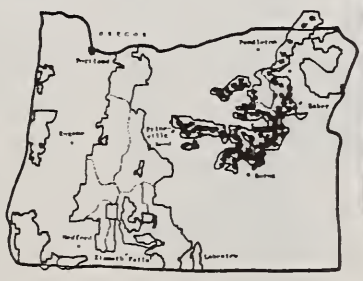
Revegetation: On slopes less than 25%, domestic grasses can be successfully seeded providing competing vegetation is reduced. Bitterbrush is a key winter game forage and should not generally be reduced. Therefore, site preparation may be difficult. Bitterbrush may be seeded in alternate drill rows or planted. On most site, sagebrush may be treated with chemicals at a time when application is not seriously detrimental to bitterbrush.

Bitterbrush with fescue

CHARACTERISTICS (5 plots)

	Herbage	Surface Rock	Erosion Pavement	Bare Ground	Moss
Mean	375 lbs	6 %	12 %	11 %	5 %
5% level	65 lbs	6 %	9 %	10 %	6 %

RANGE CONDITION fescue
(Decreasers: bitterbrush, wheatgrass,
Good: 45% cover or 8 + plants
Fair: 22-44% or 4-7 plants
Poor: 2-21% or 1-3 plants
V. Poor: no decreasers



Scattered bitterbrush/wheatgrass

CURLLEAF MOUNTAINMAHOGANY - GRASS SD-49
(Cercocarpus ledifolius - grass) (5C)

Range Condition Guide: Agropyron-Festuca, shallow soil, Flat slope column R6-2210-23 or
Mixed conifer-Calamagrostis R6-2210-53

ENVIRONMENT

Slope position: Mid to top(low)
Aspect: southerly (northerly)
% slope: 10-60%
Elevation: 3500-6000 (7500)
Topography: rolling to rough

SOILS

Geology: Basic & acid lavas
Total depth: 10-25 (35)
Effective depth: 5-20
Stonyness: 40-70 (15)
Texture: sandy loam to loam
Structure: weak to moderate
Special: very stony soils and well cracked bedrock

VEGETATION

Dominants	% Cover	Status
Mountainmahogany	15-60	Decreaser, difficult to regenerate
Wheatgrass	0-30	Decreaser, southerly, low elev.
Fescue	0-30	Decreaser, northerly, mid elev.
Elk sedge	0-60	Decreaser, mid to upper elev.
Pinegrass	**0-60**	**Decreaser, mid to upper elev.**

Good condition: two kinds of ground vegetation common - bunchgrasses or sedge. This type is too limited in area for special type characterization for the grasses. With bunchgrass, wheatgrass and/or fescue dominate with from 30 to 50% crown cover depending upon density of mahogany. Elk sedge often has some pinegrass with it and varies from 40 to 60% cover depending upon mahogany density. Mahogany varies from 15 to 60% crown cover.

Poor condition: generally litter covered ground with cheatgrass, Ross sedge, sandberg bluegrass, and many exposed rocks.

Revegetation: Soils generally are too rocky to permit seeding grass. Mahogany does not sprout easily from the root collar so lopping tall shrubs has not proven too successful. Planting mahogany transplant may be possible if stony soils permit.

Indicators: mahogany clumps nearly always are associated with rock outcrops or rocky soils.

Mahogany with pinegrass

Mahogany with wheatgrass

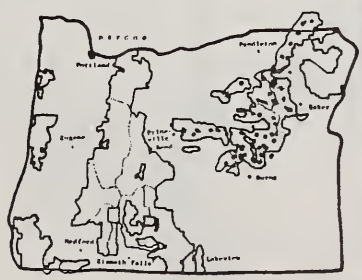
Mahogany with elk sedge

CHARACTERISTICS (4 plots)

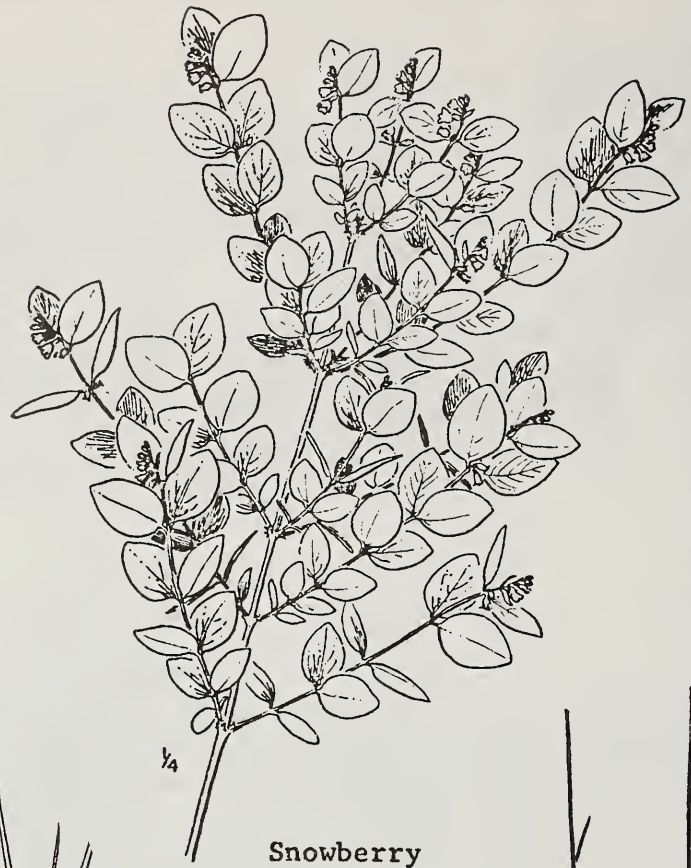
	Herbage	Surface Rock	Erosion Pavement	Bare Ground	Moss
Mean	366 lbs	25%	10%	3 %	0 %
5% level	38 lbs	18%	9%	3 %	%

RANGE CONDITION elk
(Decreasers: Wheatgrass, fescue, sedge

Good: 50% cover or 5 + plants
Fair: 25-49% or 3-4 plants
Poor: 2-24% or 1-2 plants
V. Poor: no decreasers



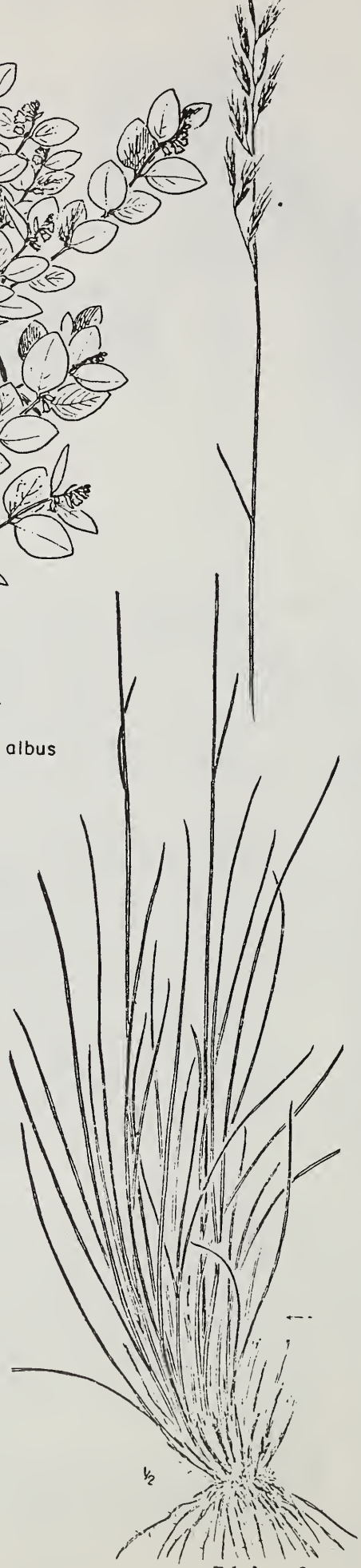
3 dm. = 12 inches



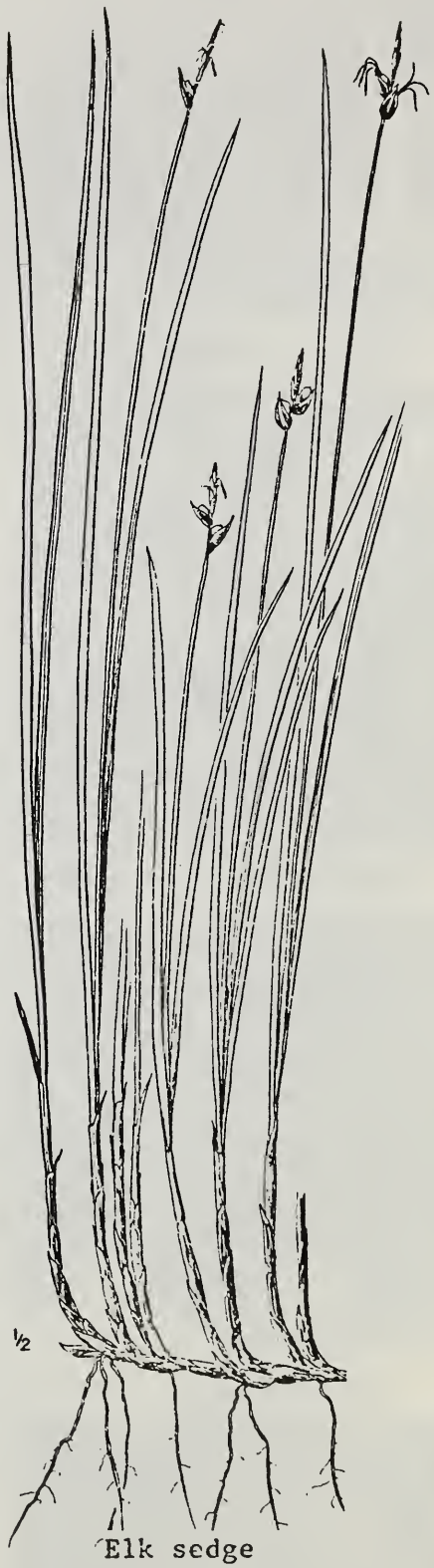
Snowberry

Symphoricarpos albus

Bluebunch wheatgrass



Idaho fescue



Elk sedge

C. geyeri

SNOWBERRY SHRUBLAND SM-31
(Symphoricarpos albus shrubland) (5S)

Range Condition Guide: **(none)**


Snowberry shrubs rear of meter board in bunchgrass.


Snowberry-elk sedge due to soil in pine-pinegrass.


Erect snowberry-fescue.

ENVIRONMENT
Slope position: **low to upper**
Aspect: **southerly (northerly)**
% slope : **30-80 (5) (120)**
Elevation: **1700-5800**
Topography: **rolling to rough**

SOILS
Geology: **lavas, tuffs**
Total depth: **24-48**
Effective depth: **12-36**
Stonyness: **5-40 (60)**
Texture: **loams to silt loams**
Structure: **moderate, blocky**
Special: **apparently good moisture**

VEGETATION

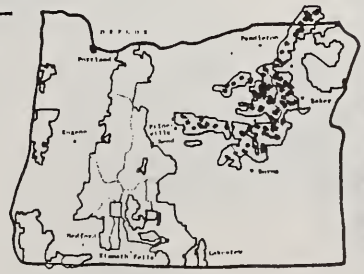
Dominants	% Cover	Status
Snowberry	**15-40 (60)**	**Climax, erect to low shrub**
Wheatgrass	**15-24 (0)**	**Decreaser, lower elevations**
Fescue	**0-10**	**Decreaser, northerly slopes**
Elk Sedge	**15-40**	**Decreaser, upper elevations**

Good condition: Snowberry clearly dominates as an upright shrub at lower elevations with bunchgrasses. As elevation increases, snowberry tends to assume a more rhizomatous habit sometimes not exceeding 8-10 inches tall. Under these conditions, grass seems to dominate the community, however, snowberry characteristically accounts for 20 to 40% crown cover.
Poor condition: Snowberry clearly dominates all communities; it is often severely hedged. At lower elevations, cheatgrass may be common; at upper elevations Ross sedge, needlegrass, and yarrow may dominate herbs.
Revegetation: Soils are suitable for revegetation; however, steep slopes and control of snowberry in its rhizomatous form tend to preclude extensive seeding. Snowberry is a moderately palatable shurb. Sound justification should be made for its control.
Indicators: Snowberry indicates rather good soils and may indicate some potential for tree growth above 3000 feet elevation in the northern Blue Mountains. Its rhizomatous nature tends to make site preparation very difficult

CHARACTERISTICS (3 plots)

	Herbage	Surface Rock	Erosion Pavement	Bare Ground	Moss
Mean	320 lbs	21%	3%	5%	0%
5% level	67 lbs	18%	3%	4%	

RANGE CONDITION
(Decreasers: **wheatgrass, fescue, sedge**)
Good: **40% cover or 5 + plants**
Fair: **20-39% or 3-4 plants**
Poor: **2-19% or 1-2 plants**
V. Poor: **no decreasers**

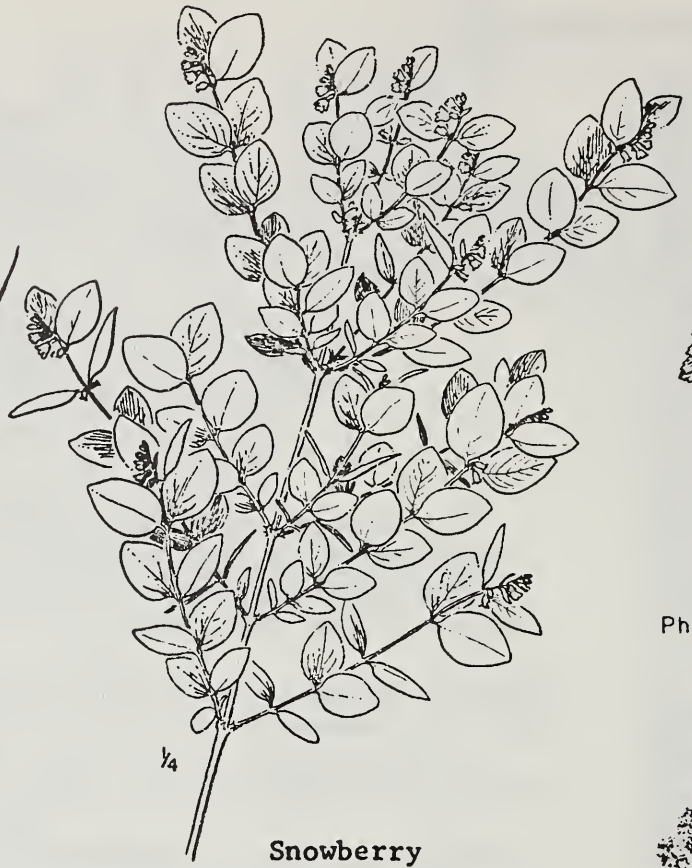



9 dm = 36 inches deep.

SNOWBERRY SHRUBLAND SM-31

Elk sedge

C. geyeri



Snowberry

Symphoricarpos albus

Ninebark

Physocarpus malvaceus

Spirea

Spiraea betulifolia

Oceanspray

Holodiscus discolor

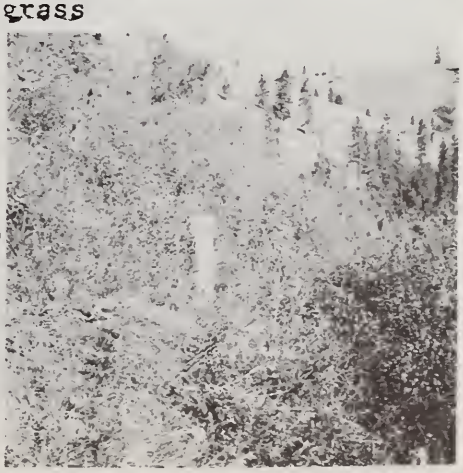
NINEBARK SHRUBLAND SM - 19
(physocarpus malvaseus) (5N)

Range Condition Guide: (none)

Ninebark with oceanspray

Ninebark dominant

Open ninebark with pinegrass



ENVIRONMENT

Slope position: low to top
Aspect: northerly (southerly)
% slope 60-120 (30)
Elevation: 1700-5800 ft.
Topography: steep to rough

SOILS

Geology: basic lavas, tuffs
Total depth: 24-48 inches (8)
Effective depth: 12-36 inches (4)
Stonyness: 30-60% (0)
Texture: loams, silt loams
Structure: moderate granular
Special: soil seems suitable for tree growth (see below)

VEGETATION

Dominants	% Cover	Status
Ninebark	20-60 (80)	Clearly dominant shrub, climax
Snowberry	3-20 (40)	Always subordinate to codom.
Oceanspray	0-40	Lower elevations
Spirea	0-10	Nearly always present
Elk sedge	0-20	Most common herb, open stands

Good condition: Ninebark accounts for more than half the shrub cover. "Condition" not really a suitable term; herbage production and cover of sedges depends upon density of ninebark and other shrubs; sedges productive with less than a total of 60% crown cover by all shrubs (and ninebark characteristically accounts for over half of the shrub cover). When snowberry accounts for more than half the shrub cover, the type should be classed as SNOWBERRY **SHRUBLAND SM-31**

Poor condition: herbaceous plants essentially absent except for hartleaf arnica and yarrow. Snowberry and spirea may be well browsed.

Revegetation: Generally not possible due to steep slopes; soil is quite suitable.

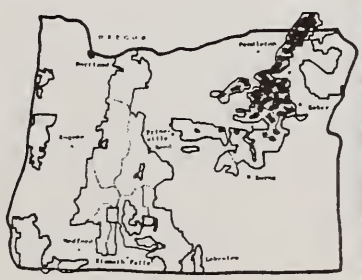
Silviculture: The ninebark shrubland differs little from the shrub community under ponderosa pine and Douglas fir (the DOUGLAS-FIR - NINEBARK - SEDGE CD-S7-11). This may be a fire induced shrubland suitable for conversion to trees. Some fir are reproducing in the type. Control of shrub competition during tree establishment would be difficult: chemical treatment and planting suitable stock desirable.

CHARACTERISTICS (9 plots)

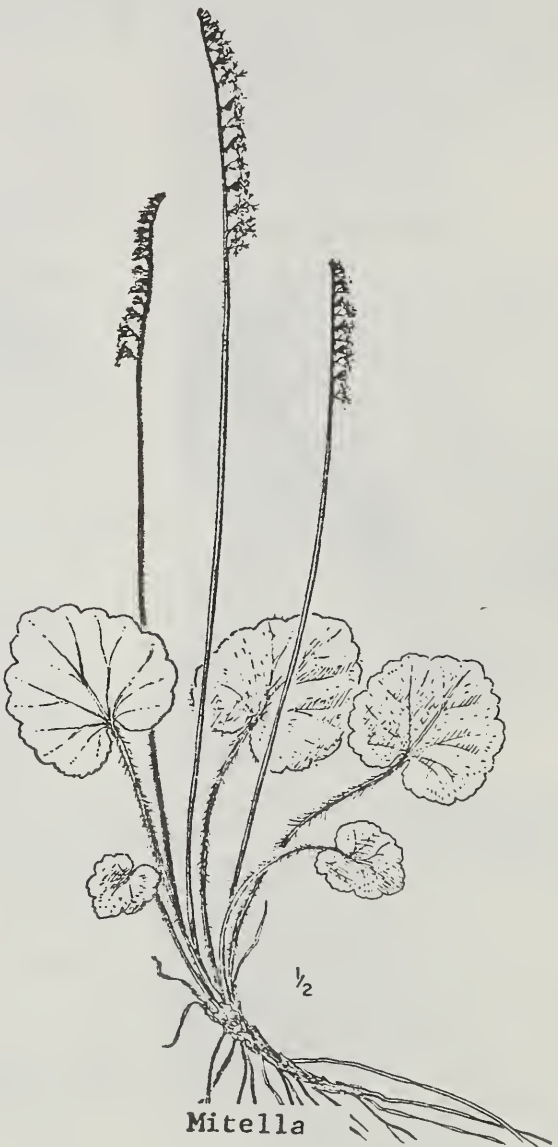
	Herbage	Surface Rock	Erosion Pavement	Bare Ground	Moss
Mean	195 lbs	2 %	0 %	0 %	20%
5% level	97 lbs	4 %	%	%	20%

RANGE CONDITION

(Decreasers: Elk sedge
Good: 20% cover or xx + plants
Fair: 10-19% or xx-xx plants
Poor: 2-9% or xx-xx plants
V. Poor: no decreasers



Thinleaf Alder
Alnus incana



Mitella
Mitella stauropetala

V. membranaceum
Big huckleberry

THINLEAF ALDER SNOWSLIDES SM-29
(Alnus tenuifolia snowslide communities) (5A)

Range Condition Guide: (none)

Head of snowslide

ENVIRONMENT

Slope position: top to bottom
Aspect: northerly (southerly)
% slope: 40-120 (15)
Elevation: 2000-6000
Topography: steep to rough

SOILS

Geology: lavas, tuffs, granitics
Total depth: 24-48 inches (10)
Effective depth: 18-40 inches
Stonyness: 0 to 35%
Texture: loams to silt loams
Structure: moderate blocky
Special: Soils often subject to slippage.

VEGETATION

Dominants	% Cover	Status
Thinleaf alder	40-60 (80)	Disturbance climax due to snow slides
Big huckleberry	5-20 (40)	Common in adjacent forest
Mitella	2-5	Common in adjacent forest

Wet soil vegetation

Condition: These communities are related to snow sliding down "V" shaped canyons in the steep central and northern Blue Mountains. Alder dominates because it can stand the action of cascading snow which periodically brakes off or uproots regenerating trees. Alder can be found scattered in adjacent forest as can most of the other plants in this community.
Revegetation: is not possible due to snow slides and steep slopes.
Silviculture: Many of these sites have sufficient soil to support tree gorwth. However, trees are not suited to the sites due to cascading snow.

Dense thicket, snow bent

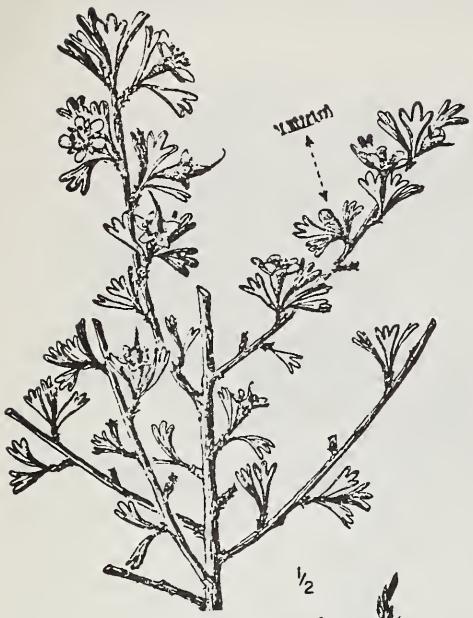
CHARACTERISTICS (5 plots)

	Herbage	Surface Rock	Erosion Pavement	Bare Ground	Moss
Mean	100 lbs	0 %	0 %	0 %	0 %
5% level	100 lbs	%	%	%	%

Alder and huckleberry

RANGE CONDITION
(Decreasers: xxx
Good: xx % cover or xx + plants
Fair: xx-xx or x-x plants
Poor: xx-xx or x-x plants
V. Poor: no decreasers

PONDEROSA PINE - WHEATGRASS CP-G1-11



Bitterbrush

var. intercedens

Cercocarpus ledifolius

Mountainmahagony

Sandberg bluegrass

Idaho fescue

Bluebunch wheatgrass

A. tridentata

Big Sagebrush

PONDEROSA PINE - WHEATGRASS CP-G1-11
(Pinus ponderosa - Agropyron) **(6A)**

Range Condition Guide: R6 - 2210-51
Tree Stocking Guide :
Silviculture Guide :

ENVIRONMENT
Slope position: all positions
Aspect: southerly (northerly)
% slope: 1 - 100%
Elevation: 2500-5000 (6000)
Topography: undulating to rough

SOILS
Geology: basic lavas to serpentine
Total depth: 15-36"(50)
Effective depth: 7-24"(38)
Stonyness: 20-60% (0)
Texture: loamy sand to loam
Structure: weak to moderate
Special: weak structured soils subject to dry ravel and displacement on steep slopes.

VEGETATION

Dominants	% Cover	Status
Ponderosa pine	5-25	Climax tree
Big sagebrush	0-35	Climax in southern Blue Mtns.
Bitterbrush	0-20	Climax on moister sites
Curlleaf mahogany	0-20	Climax on stony soils
Wheatgrass	20-40(60)	Major decreaser
Sandberg bluegrass	5-15	Increaser

Good Range Condition: Shrub dominate under pine in the southern Blue Mtns and decrease to absent in the northern Blues. Wheatgrass clearly dominates herbaceous plants. Fescue may be present to nearly co-dominant with wheatgrass. This community intergrades with PONDEROSA PINE - FESCUE CP-G1-12 .
Poor Range Condition: palatable shrubs are well hedged , cheatgrass and bluegrass dominate herbage; bare soil and pine litter on the soil surface.
Revegetation: Dryland grasses are required for seeding after logging or other disturbance. Stony, shallow soils often make revegetation marginally economic.
Silviculture: Pine growth is slow; site is not commercial (less than 20 cu.ft./acre). Regeneration is extremely difficult due to very droughty soils. Ponderosa and juniper are the only trees suited to the site. Tree cover is below that usually recommended for shelterwood regeneration; no suitable method of regeneration is known.
Indicators: Big sagebrush indicates very dry sites; mahogany indicates stony, low fertility soils, bitterbrush indicates fair site for this type; fescue and elk sedge indicate best sites.

PRODUCTIVITY (20 plots)

	Herbage	Site Index PP			TBA	GBA	Cu. Ft. Per Yr.
Mean	429 lbs	57			33	23	10
5% level	87 lbs	5			6	5	3

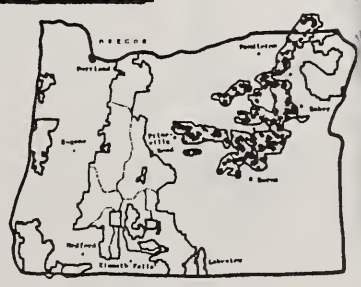
RANGE CONDITION
(Decreasers: wheatgrass, fescue, elk sedge)
Good: 55 % cover or 5 + plants
Fair: 27-54 % or 3 - 4 plants
Poor: 2-26 % or 1 - 2 plants
V. Poor: **no decreasers**

Mahogany and sagebrush

Bitterbrush and wheatgrass

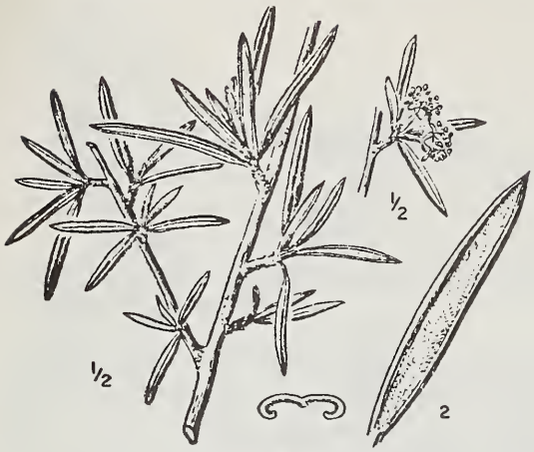
Wheatgrass without shrubs

6 dm. = 24 inches



PONDEROSA PINE - WHEATGRASS CP-G1-11

PONDEROSA PINE - FESCUE CP-G1-12



var. intercedens

Cercocarpus ledifolius

Mountainmahagony

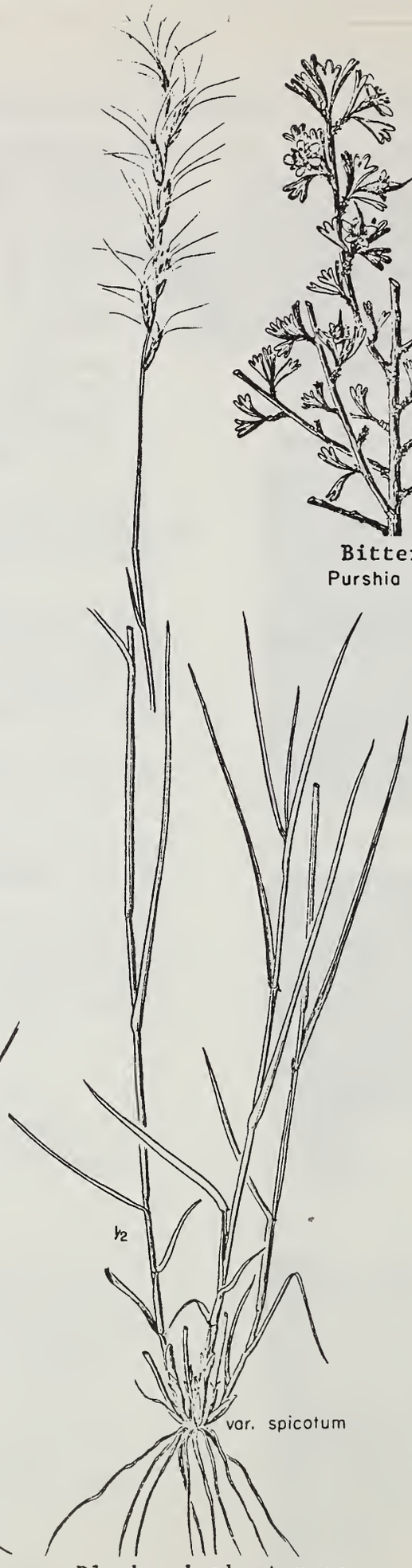
Bitterbrush

Purshia tridentata

Elk sedge

C. geyeri

Idaho fescue



Bluebunch wheatgrass

PONDEROSA PINE - FESCUE CP-G1-12
(Pinus ponderosa - Festuca) **(6F)**

Range Condition Guide: R6-2210-51
Tree Stocking Guide :
Silviculture Guide :

Bitterbrush and fescue

ENVIRONMENT
Slope position: low to top
Aspect: all aspects
% slope: 2 - 30%(60)
Elevation: 2500-5500
Topography: undulating to rough

SOILS pumice ash, serpentine
Geology: lavas, sedimentary, tuff
Total depth: 18-36"(48)
Effective depth: 10-30"(48)
Stonyness: 10-50(0)
Texture: sandy loam to silt loam
Structure: weak to moderate
Special: ash and weak structured soils subject to dry ravel and displacement on steep slopes.

VEGETATION

Dominants	% Cover	Status
Ponderosa pine	15-40(8)	Climax tree
Fescue	25-45(60)	Decreaser, low in palatability
Sandberg bluegrass	0-10(20)	Increaser
Wheatgrass	0-20	Decreaser, high palatability
Bitterbrush	0-10	Decreaser, drier sites
Mahogany	0-15	Decreaser, stony soils

Mahogany and fescue

Good range condition: Fescue must dominate over wheatgrass for classification in this community; intergrades between PINE - FESCUE and PINE - WHEATGRASS are common. Shrub tend to dominate grasses in the southern Blue Mountains and decrease to absent in the Northern Blues.

Poor Range Condition: dominance of wheatgrass, Sandberg bluegrass, and some yarrow. Tree reproduction may be rather dense which effectively inhibits increase of forage grasses.

Revegetation: Dryland grasses and herbs are required. In most cases, soil is suitable for successful revegetation.

Silviculture: Non-commercial to marginal site; ponderosa pine only tree suitable for the site; stocking density produces crown cover approaching shelterwood therefore regeneration cutting is dependent upon seed source or planting; fescue is a severe compeditor and must be controlled for planting; regeneration in good range condition is extremely difficult, under poor condition less difficult; a 5 year regeneration cycle can not be assured due to dry climate and stony, droughty soils.

Indicators: lower slope positions and concave microtopography associated with:better pine S.I., greater GBA, greater Cu.Ft. productivity: elk sedge on moister sites.

Mahogany, bitterbrush, fescue

PRODUCTIVITY (20 plots)

	Herbage	Site Index PP			TBA	GBA	Cu. Ft. Per Yr.
Mean	359 lbs	61			65	44	19
5% level	32 lbs	4			12	5	4

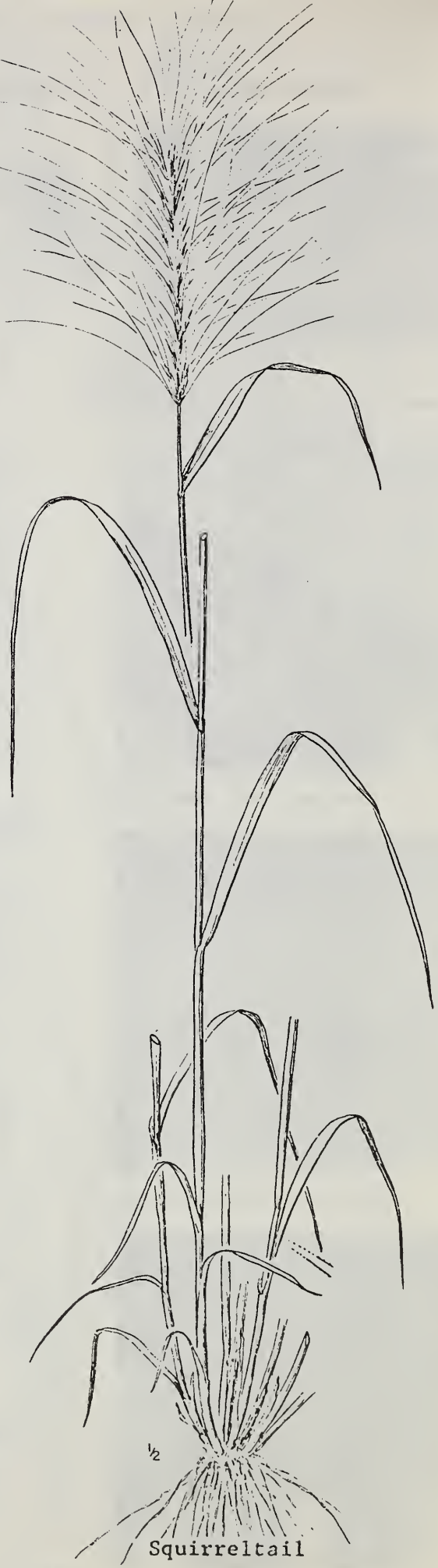
RANGE CONDITION
(**Decreasers:** Fescue, wheatgrass, elk sedge
Good: 45 % cover or 7 + plants
Fair: 22 - 44% or 4 - 6 plants
Poor: 2 - 21 % or 1 - 3 plants
V. Poor: **no decreasers**

6 dm. = 24 inches

Bitterbrush
Purshia tridentata

Ross sedge
C. rossii

Needlegrass
S. occidentalis



Squirreltail

PONDEROSA PINE - BITTERBRUSH - ROSS SEDGE CP-S2-21
(Pinus ponderosa-Purshia-Carex rossii) (6PR)

Range Condition Guide: R6-2210-25
Tree Stocking Guide :
Silviculture Guide :

ENVIRONMENT

Slope position: mid to top (low)
Aspect: southerly (northerly)
% slope: 1-15 (35)
Elevation: 4500 - 5500
Topography: dissected, rolling

SOILS

Geology: rhyolite and tuff
Total depth: 12-24 inches
Effective depth: 6 - 15 inches
Stonyness: 15-50% (65)
Texture: sandy loam to loamy sand
Structure: weak to none
Special: soil very subject to dry ravel on slopes over 20%, displaces under animals

VEGETATION

Dominants	% Cover	Status
Ponderosa pine	25-45	Climax tree
Bitterbrush	5-35	Decreaser, decreases from west to east
Squirreltail	5-10	Decreaser, palatable
Ross Sedge	10-20	Decreaser, palatable
Needlegrass	3-10	Decreaser, palatable

Good Range Condition: Ground is dominated by bitterbrush of decreasing density from western Snow Mountain District to eastern Burns District; herbaceous vegetation significantly lacks fescue and wheatgrass, instead, it appears like poor to fair condition bunchgrass with Ross sedge and squirreltail the dominant plants.

Poor Range Condition: hedged bitterbrush with little more than litter on the forest floor.

Revegetation: Shallow, stony, infertile soils do not produce abundent herbage from domestic grasses - density is low; use dryland species.

Silviculture: A very marginally commercial site; ponderosa is the only tree suitable for the site; stockability is low-only 45 to 70 sq.ft. B.A. for 15 rings per inch growth of crop trees; regeneration cutting by shelterwood is recommended; regeneration is moderately easy due to poorly competative grasses but growth of young trees tends to be slowed by bitterbrush; planting may be difficult on some sites due to very stony soils.

Indicators: bedrock of light grey, cream, tan or whitish color, sandy texture and lighter weight than basalt indicates tuff or rhyolite material; limited to southern Burns and Snow Mtn. Dist.

Moderate bitterbrush on flow rhyolite derived soil.

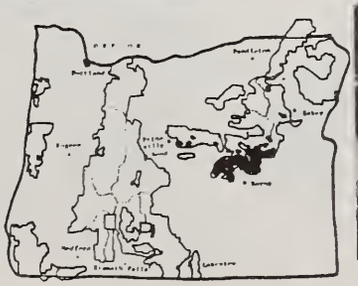
PRODUCTIVITY (6 plots)

	Herbage	Site Index PP			TBA	GBA	Cu. Ft. Per Yr.
Mean	194 lbs	64			102	55	23
5% level	35	4			29	8	4

RANGE CONDITION

(Decreasers: Ross sedge, squirreltail, needlegrass

Good: 30 % cover or 6 + plants
Fair: 15-29 % or 3 - 4 plants
Poor: 2-14 % or 1 - 2 plants
V. Poor: no decreasers



Dense bitterbrush on tuff derived soil.

PONDEROSA PINE - BLUE WILDRYE CP-M1-11

Kentucky bluegrass

P. pratensis

Snowberry

Symphoricarpos albus

Vetch

Blue wildrye

Elymus glaucus

PONDEROSA PINE - BLUE WILDRYE CP-M1-11
(Pinus ponderosa - Elymus glaucus) **(6E)**

Range Condition Guide: R6-2210-24
Tree Stocking Guide :
Silviculture Guide :

Rhizomatous snowberry

Bluegrass and whildrye

5 dm. = 20 inches

ENVIRONMENT
Slope position: low to bottom
Aspect: southerly(northerly)
% slope: 2-20
Elevation: 2500 - 5000
Topography: undulating - steep

SOILS
Geology: alluvium, sedimentary
Total depth: 24-38" (48)
Effective depth: 20-36" (48)
Stonyness: 10-30%
Texture: loam to clay loam
Structure: moderate to strong
Special: early spring moisture may cause trampling damage from livestock.

VEGETATION

Dominants	% Cover	Status
Ponderosa pine	30-40(15)	Climax tree
Douglas-fir	0-20	Climax tree with pine on norths
Blue wildrye	15-30(45)	Decreaser,
Kentucky bluegrass	40-60	Increaser, decreaser with heavy
Snowberry	0-10	Increaser, rhizomatous use

Good Condition: ground dominated by blue wildrye with Kentucky bluegrass generally occupying more crown cover but less forage production; sod unbroken.
Poor condition: Generally a patchy, broken sod of Kentucky bluegrass with yarrow, snowberry, and often excessive tree reproduction. Dense tree reproduction inhibits grass increase.
Revegetation: Dry meadow grass species are suitable; soils are most suitable for success.
Silviculture: Both ponderosa pine and Douglas-fir may be grown successfully. However, stocking capability is low, only 40 to 60 Sq.Ft. B.A. for 15 rings per inch diameter growth of crop trees. This is a "forested meadow" site of low tree growth potential. Stand density under management is similar to a dense shelterwood stand. Clearcutting tends to invite use by livestock - it creates a dry meadow. Regeneration is very difficult due to rhizomatous habits of both dominant grasses; site preparation is required; planting ponderosa pine is recommended.
Indicators: Low slope position and dark brown to black soil surface color indicate this site. Sub-soils are often clay loams to clay which are more suited to grass growth than tree establishment.

PRODUCTIVITY (4 plots)

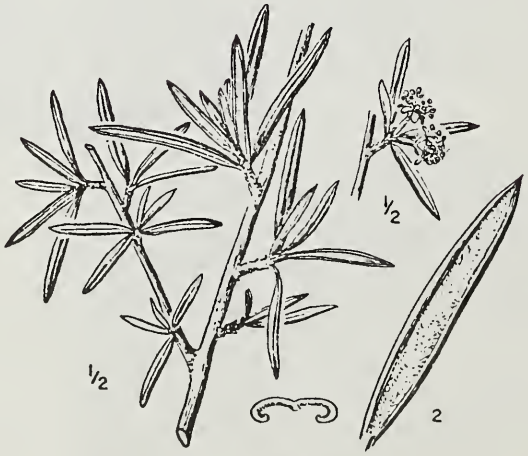
	Herbage	Site Index PP			TBA	GBA	Cu. Ft. Per Yr.
Mean	1009 lbs	74			109	55	30
5% level	489	4			29	13	11

RANGE CONDITION
(**Decreasers:** Wildrye, bluegrass
Good: 80 % cover or Solid + plants
Fair: 40-80 % or xx - xx plants
Poor: 2-39 % or xx - xx plants
V. Poor: **no decreasers**

Elk sedge

Pinegrass
C. rubescens

Snowberry
Symphoricarpos albus



var. intercedens
Cercocarpus ledifolius
Mountainmahagony

Bitterbrush
Purshia tridentata

PONDEROSA PINE - DOUGLAS-FIR - ELK SEDGE CD-G1-11
(Pinus ponderosa - Pseudotsuga menziesii - Carex geyeri) (6S)

Range Condition Guide: R6-2210-53
Tree Stocking Guide :
Silviculture Guide :

ENVIRONMENT
Slope position: low to top
Aspect: all aspects
% slope: 5 - 30 (100)
Elevation: 4000 - 6200
Topography: undulating to rough

SOILS (no pumice ash)
Geology: lavas, granitics, tuff,
Total depth: 16-30" (10) (40)
Effective depth: 10-20" (4) (40)
Stonyness: 20 - 60% (0)
Texture: sandy to loamy
Structure: weak (moderate)
Special: some tendency to dry ravel on steep slopes and subject to displacement under animals.

VEGETATION

Dominants	% Cover	Status
Ponderosa pine	30-60 (15)	Climax tree,
Douglas-fir	0-40	Climax tree, increases northerly
Bitterbrush	0-20	Decreaser, decreases easterly
Mahogany	0-30	Decreaser
Elk sedge	30-60 (80)	Decreaser, rhizomatous

Good Range Condition: Ground vegetation is clearly dominated by elk sedge. Bitterbrush and/or mountain mahogany may be present; either of both tend to separate this community from the closely related MIXED CONIFER - PINEGRASS, RESIDUAL SOIL CW-G1-11 type. Sedge sod is unbroken even though sedge leaves do not entirely cover the ground (typically only 30-60% crown cover); some pinegrass may be present.
Poor Range Condition: most herbaceous plants are inconspicuous or missing; litter dominates the "understory"; overly dense tree reproduction inhibits increase in sedge.
Revegetation: moist climate, pasture type grasses are suitable; soils are suitable for revegetation; production often exceeds native herbage.
Silviculture: a poor commercial timber site; both ponderosa and Douglas-fir may be grown although Douglas-fir seems less suited in the Southern Blues; stockability is moderately low - 65 to 75 sq.ft. B.A. for 15 rings per inch growth of crop trees; shelterwood regeneration suggested; regeneration very difficult in good range condition due to rhizomatous habit of elk sedge - control required for planting.
Indicators: Bitterbrush and mahogany indicate poor tree growth, pinegrass indicates best growth.

PRODUCTIVITY (19 plots)

	Herbage	Site Index PP	Site Index DF		TBA	GBA	Cu. Ft. Per Yr.
Mean	341 lbs	64	70		111	71	31
5% level	33 lbs	3	5		16	7	3

RANGE CONDITION
(Decreasers:
Good: 50 % cover or xxx + plants
Fair: 25-49 % or xx - xx plants
Poor: 2-24 % or xx - xx plants
V. Poor: no decreasers

Bitterbrush with elk sedge

Pine and pure sedge.

Fir regeneration and sedge

5 dm. = 20 inches

Baldhip rose
Rosa gymnocarpa

Serviceberry

Snowberry

Elk sedge

Oceanspray

Pinegrass

Spirea

PONDEROSA PINE - DOUGLAS-FIR - SNOWBERRY - OCEANSPRAY CD-S6-11
(Pinus ponderosa - Pseudotsuga-Symphoricarpos-Holodiscus) (6SH)

Range Condition Guide: R6-2210-53
Tree Stocking Guide :
Silviculture Guide :

Snowberry and fir seedlings

ENVIRONMENT

Slope position: bottom to mid-top
Aspect: northerly (southerly)
% slope: 3 - 35 (80)
Elevation: 1700 - 4800
Topography: rolling to steep

SOILS

Geology: ash, loess, basic lava
Total depth: 30-60"
Effective depth: 20 - 60"
Stonyness: 0 - 60
Texture: loams to silty loam
Structure: weak to moderate
Special: generally fertile soil simialr to palouse soils

VEGETATION

Dominants	% Cover	Status
Ponderosa pine	35-60	Climax tree, decreases with elev.
Douglas-fir	0-40	Climax tree, increases with elev.
Snowberry	20-70 (7)	Increaser, shrubby to rhizomatous
Oceanspray	0-40	Increaser, increases easterly
Spirea	2-35	Increaser, increases with elev.
Ninebark	0-20	Increaser
Elk sedge	10-40	Decreaser, decreases northerly
Pinegrass	0-40	Decreaser

Oceanspray and snowberry

Good Range Condition: Shrubs dominate with elk sedge and pinegrass carpeting the soil surface; shrub dominance varies considerably. Ninebark must not exceed 50% of all shrub cover; closely related to PONDEROSA - DOUGLAS-FIR - NINEBARK CD-57-11.

Poor Range Condition: is indicated primarily by greatly reduced grass cover and often browsing of shrubs; little obvious change.

Revegetation: Soils are very suitable for pasture type grasses, however, shrub competition must be controlled; all sprout.

Silviculture: Both ponderosa and fir can be grown; moderately good commercial timber site; stockability is 105 - 130 sq.ft. B. A. for 15 rings per inch growth of crop trees; shelterwood type regeneration often stimulates shrubs if their control is not planned; clearcuts are suitable on northerly slopes; tree establishment is often rather good, however shrubs tend to reduce height growth.

Indicators: Increasing elevation and % slope are associated with increasing fir, decreasing pine, increasing tree productivity, increasing spirea cover.

11 dm. = 44 inches

PRODUCTIVITY (14 plots)

	Herbage	Site Index PP	Site Index DF		TBA	GBA	Cu. Ft. Per Yr.
Mean	384 lbs	72	70		147	118	58
5% level	48 lbs	9	12		57	28	15

RANGE CONDITION

(**Decreasers:** elk sedge, pinegrass)

Good: 30% cover or xx + plants
Fair: 15-29% or xx - xx plants
Poor: 2-14% or xx - xx plants
V. Poor: **no decreasers**

Baldhip rose

Ninebark

Spirea

Elk sedge

Pinegrass

Snowberry

PONDEROSA PINE - DOUGLAS-FIR - NINEBARK CD-S7-11
(Pinus ponderosa - Pseudotsuga-Physocarpus)

Range Condition Guide: R6-2210-53
Tree Stocking Guide :
Silviculture Guide :

ENVIRONMENT
Slope position: top to bottom
Aspect: northerly (southerly)
% slope: 3 - 60 (120)
Elevation: 2500 - 5500
Topography: undulating - rough

SOILS
Geology: pumice ash, lavas, tuff
Total depth: 30-60" (18)
Effective depth: 30-60" (15)
Stonyness: 0 - 45%
Texture: fine sandy loam - loam
Structure: weak (moderate)
Special: ash soil subject to displacement on steep slopes

VEGETATION

Dominants	% Cover	Status
Ponderosa pine	0-50	Climax to successional
Douglas-fir	20-60 (0)	Major climax, steep north slopes
Ninebark	25-60 (80)	Increaser shrub
Snowberry	5-20 (40)	Increaser, shrubby or rhizomatous
Pinegrass	20-50	Decreaser, less under dense shrubs
Elk sedge	5-20	Decreaser

Good Range Condition: At least 50% of all shrub cover must be accounted for by ninebark; if not, the type is a PONDEROSA - DOUGLAS-FIR - SNOWBERRY - OCEANSPRAY CD-S6-11 type. Ninebark may be the only obvious shrub. Grasses occupy the soil surface in density related to shrub and tree cover density; with 40% tree and 20% shrub cover, grasses may be 70% crown cover.
Poor Range Condition: Shrubs are little affected by livestock overgrazing, they are key indicators of the type. Grasses are greatly reduced, replaced by forbs and tree litter.
Revegetation: Soils are most suitable for revegetation, however shrub competition must be controlled; shrubs sprout.
Silviculture: Moderately good commercial site; ponderosa, Douglas-fir and larch (at upper elevations) can be grown; Stockability is fairly good, 90 to 120 sq. ft. B.A. for 15 rings per inch growth of crop trees; Douglas-fir tend to grow faster in DBH than pine; shelterwood, clearcutting on northerly slopes; shrubs are all sprouters and can compete with seedling height growth, generally/tree establishment is rather good; shrubs may require control following tree establishment.
Indicators: northerly and steeper slopes increase Douglas-fir.

PRODUCTIVITY (9 plots)

		Site Index					
	Herbage	PP	DF	WL	TBA	GBA	Cu. Ft. Per Yr.
Mean	296 lbs	72	69	48	108	103	49
5% level	36 lbs	4	13	6	35	16	5

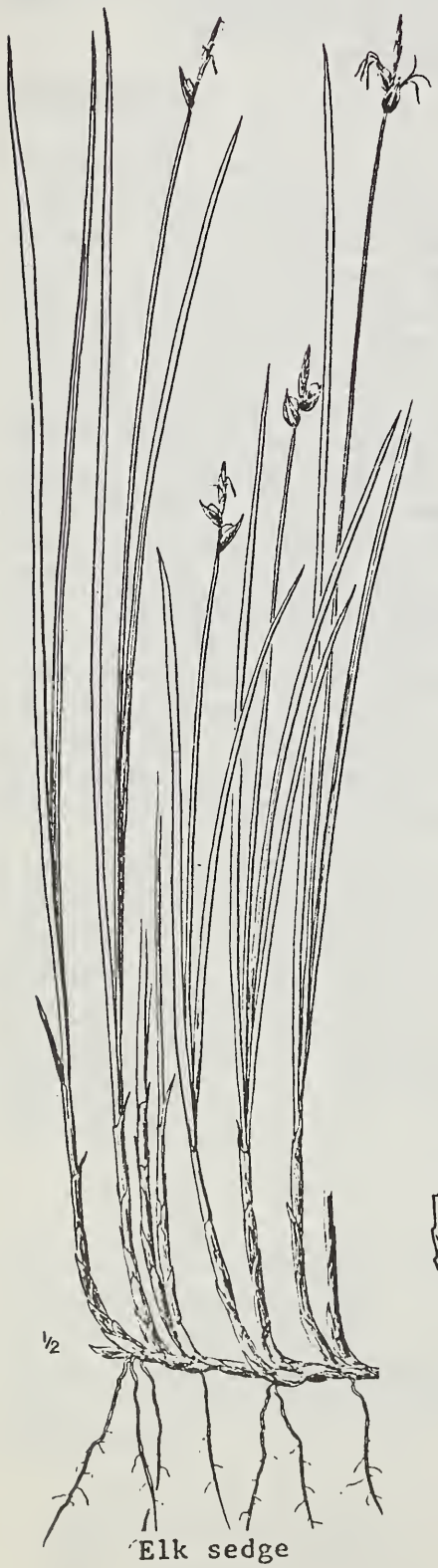
RANGE CONDITION *
(Decreasers: pinegrass, elk sedge)
Good: 60% cover or XX+ plants
Fair: 30-59% or XX - XX plants
Poor: 2-29% or XX - XX plants
V. Poor: no decreasers
*Decrease % cover 5% for each 10% increase in shrub cover over 20%

Pure fir and ninebark

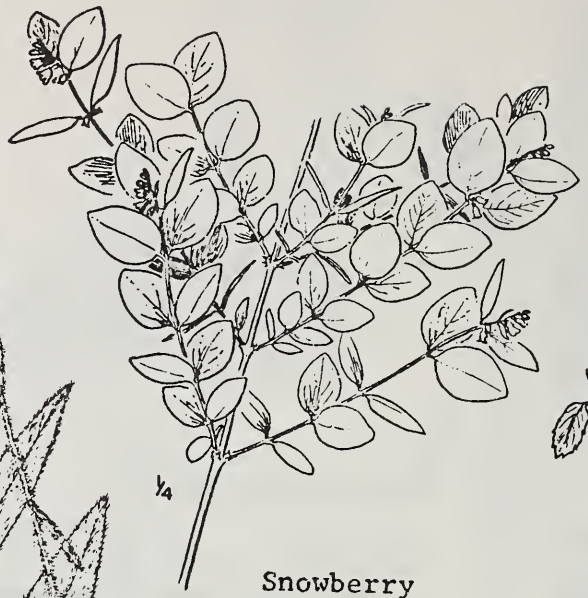
Pine, fir and ninbark

Pine, ninebark, snowberry

10½ dm. = 42 inches



Elk sedge



Snowberry

Spirea

Western hawkweed

Heartleaf arnica

Pinegrass

MIXED CONIFER - PINEGRASS, RESIDUAL SOIL CW-G1-11
(Pseudotsuga - Abies - Calamagrostis, residual soil) **(6CR)**

Range Condition Guide: R6-2210-53
Tree Stocking Guide :
Silviculture Guide :

ENVIRONMENT
Slope position: top to bottom
Aspect: all aspects
% slope: 5-60 (80)
Elevation: 4000-6500
Topography: Undulating to steep

SOILS lavas, granitic, tuff,
Geology: sedimentary, alluvial
Total depth: 24-48" (14)
Effective depth: 10-34"(5)
Stonyness: 20-60%
Texture: loamy sand - loam
Structure: weak - moderate
Special: soil compactable when wet

Nearly pure ponderosa

VEGETATION

Dominants	% Cover	Status
Ponderosa pine	20-50 (0)	Successional, maintained by fire
Douglas-fir	20-60 (0)	Climax, major at lower elevations
White(grand) fir	20-60 (0)	Climax, major at upper elevations
Pinegrass	20-40 (80)	Decreaser, decreases with shade
Elk sedge	20-40 (5)	Decreaser, decreases with shade
Heartleaf arnica	5-20 (0)	Increaser, increases with shade
Snowberry	0-10	Increaser, rhizomatous

Fir reproduction under

Good Range Condition: Pinegrass and elk sedge clearly dominate ground vegetation under 50% of less tree cover; as tree cover increases, grass decreases at the rate of 5% for each 10% increase in tree cover above 50% and arnica becomes more apparent.
Poor Range Condition: Arnica and other herbs dominate the litter covered forest floor.
Revegetation: Good results from standard pasture grasses.
Silviculture: Moderately good site; ponderosa is successional to fir, all can be grown; high risk and tree selection increase the change from pine to fir type; stockability is 80-95 sq.ft. for pine and 100-120 sq.ft. for firs for 15 rings per inch growth of crop trees; shelterwood for fir, site is not well suited to clearcutting for fir; pine regeneration requires open shelterwood, pine planting, subsequent control of fir regeneration; fir grows faster in both height and diameter than pine; pinegrass, being rhizomatous competes severely with tree seedings in good range condition.
Indicators: Increasing elevation and change to north slope associated with increasing fir, decreasing pine.

Dense fir saplings and pole

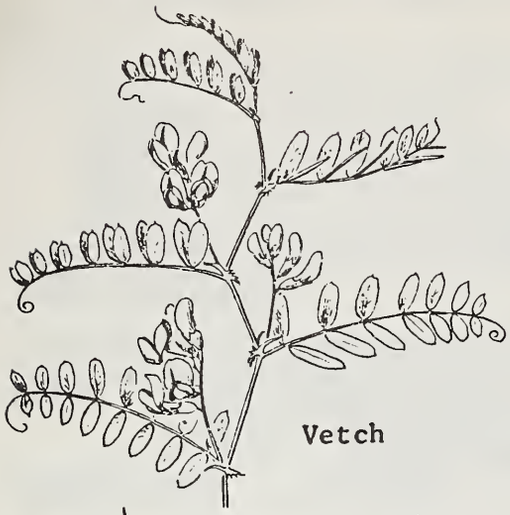
PRODUCTIVITY (16 plots)

	Herbage	Site Index PP	Site Index DF	Site Index WF	TBA	GBA	Cu. Ft. Per Yr.
Mean	309 lbs	72	81	52	129	87	43
5% level	68 lbs	3	8	3	17	8	6

RANGE CONDITION *
(Decreasers: pinegrass, elk sedge)
Good: 80% cover or xx + plants
Fair: 40-79% or xx-xx plants
Poor: 2-39% or xx-xx plants
V. Poor: no decreasers

*Decrease % crown cover of grasses 5% for each 10% increase in tree cover above 50%.

13 dm. = 52 inches



Vetch

1/2

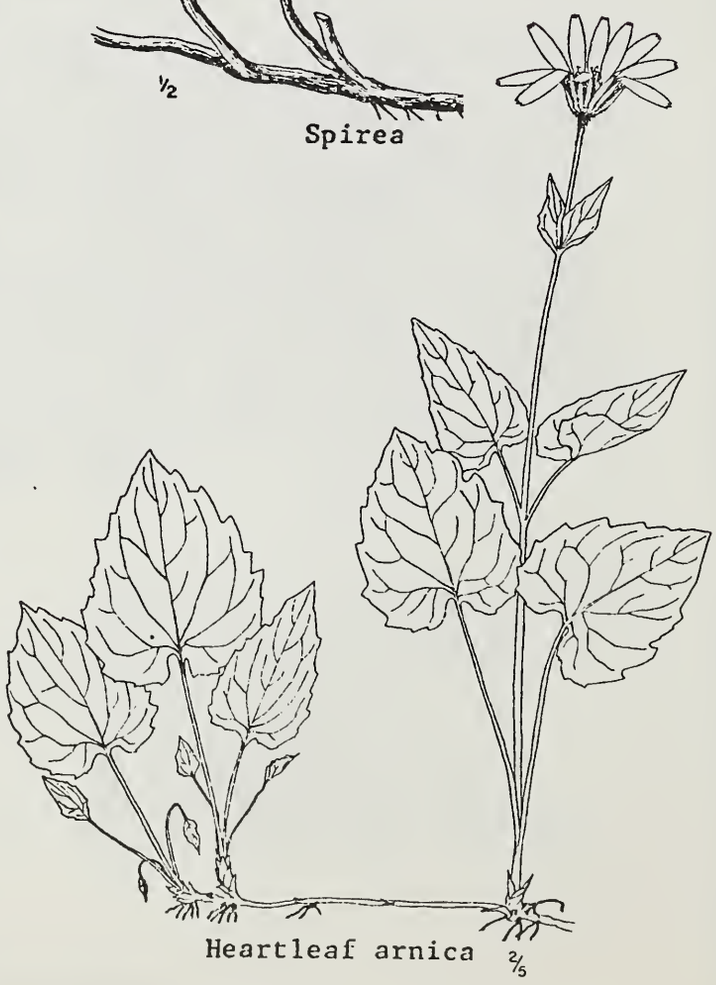
Spirea

1/4

Snowberry

1/2

Elk sedge



2/5

Heartleaf arnica

1/8

Pinegrass

MIXED CONIFER - PINEGRASS, ASH SOILS CW-G1-12
(Pseudotsuga-Abies-Calamagrostis, ash soil) (6CA)

Range Condition Guide: R6-2210-53
Tree Stocking Guide :
Silviculture Guide :

ENVIRONMENT
Slope position: top - bottom
Aspect: all aspects
% slope: 2-30 (80)
Elevation: 4000-6000 (6500)
Topography: undulating - steep

SOILS volcanic ash over soil
Geology: from any parent material.
Total depth: 24-48" (60)
Effective depth: 20-48" (60)
Stonyness: 0-35% (60)
Texture: fine loamy sand
Structure: weak to none
Special: wind erodible when exposed, high infiltration rate, displacable on steep slopes.

Nearly pure ponderosa

VEGETATION

Dominants	% Cover	Status
Ponderosa pine	35-55 (0)	Successional, maintained by fire
Douglas-fir	20-40(0)(60)	Climax, major at lower elevations
Grand (white) fir	20-40(0)(70)	Climax, major at upper elevations
Larch	0-45	Successional northerly slopes
Pinegrass	40-80 (20)	Decreaser, decreases with shade
Elk sedge	0-20 (35)	Decreaser, decreases with shade
Spirea	0-10 (20)	Increaser, rhizomatous
Heartleaf arnica	0-15 (30)	Increaser, increases with shade

Fir saplings and poles

Good Range Condition: Pinegrass clearly dominates ground cover under 50% or less tree cover; as tree cover increases, grass decreases at the rate of 5% for each 10% increase in tree cover. Arnica becomes more apparent as does strawberry.
Poor Range Condition: Grasses nearly absent, arnica, strawberry, western hawkweed common on litter covered soil.
Revegetation: Excellent results from standard pasture grasses; herbage production generally double that of native grasses.
Silviculture: Moderately good site; ponderosa (and larch) are successional to firs; all can be grown; high risk and tree selection type logging accelerates type change from pine to fir; stockability is 95-115 sq.ft. B.A. for ponderosa and 110-130 sq.ft.B.A. for firs for 15 rings per inch growth of crop trees; Shelterwood best for fir, open shelterwood or clearcut for pine and larch, must plant for pine or larch dominance; firs grow faster than pine in both height and diameter; pinegrass being rhizomatous, tends to compete severely with tree seedlings in good range condition.

Fir dominant, pine down

PRODUCTIVITY (33 plots)

	Herbage	Site Index PP	Site Index DF	Site Index WF	TBA	GBA	Cu. Ft. Per Yr.
Mean	330 lbs	75	76	56	156	105	53
5% level	56 lbs	4	3	3	19	8	5

RANGE CONDITION *
(Decreasers: pinegrass, elk sedge)
Good: 80% cover or xx + plants
Fair: 40-79% or xx-xx plants
Poor: 2-39% or xx-xx plants
V. Poor: no decreasers

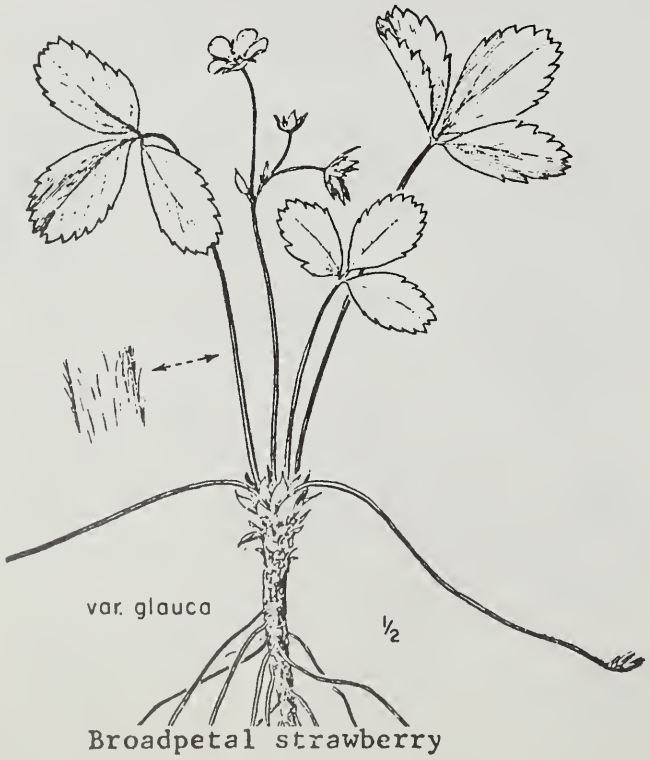
*Decrease % cover 5% for each 10% increase in tree cover over 50%.

5 dm ash (20"), 6 dm (24") buried soil

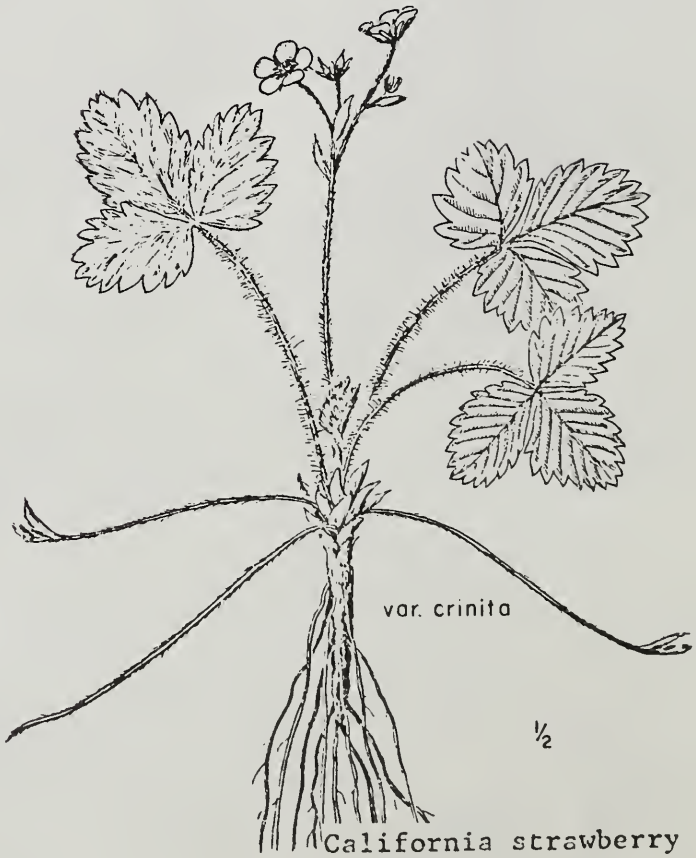
Pinegrass

White hawkweed

Grouse huckleberry



Broadpetal strawberry



California strawberry

LODGEPOLE - PINEGRASS - GROUSE HUCKLEBERRY CL-G2-11
(Pinus contorta - Calamagrostis-Vaccinium scoparium)

Range Condition Guide: R6-2210-53
Tree Stocking Guide :
Silviculture Guide :

ENVIRONMENT
Slope position: mid to top
Aspect: northerly (southerly
% slope: 2-20 (60)
Elevation: 4000-6000
Topography: undulating - steep

SOILS volcanic ash over soil
Geology: from any parent material.
Total depth: 30-60"
Effective depth: 20-60"
Stonyness: 2-25% (50)
Texture: fine loamy sand
Structure: none to weak
Special: soil subject to wind erosion, high infiltration rate.

Good condition pinegrass

VEGETATION

Dominants	% Cover	Status
Lodgepole pine	35-65	Successional to fir, fire species
White (Grand) fir	0-20	Climax species, generally reprod.
Pinegrass	40-60 (20)	Decreaser, decreases with fir.
Grouse huckleberry	2-15(0)(60)	Increaser, cold soil indicator.

Lodgepole regeneration

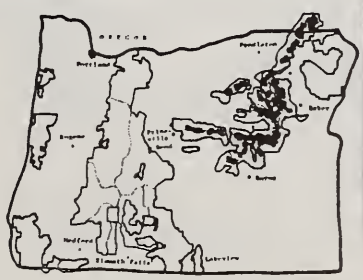
Good Range Condition: Pinegrass dominates ground vegetation, huckleberry may be co-dominant; fir reproduction often present under older lodgepole; lodgepole reproduction commonly present.
Poor Range Condition: Huckleberry often dominant with wide variety of forbs such as strawberries, white hawkseed, broad leaved lupine, arnica; resembles high elevation LODGEPOLE - GROUSE HUCKLEBERRY CL-S4-11 except that only a few species of forbs are present in the high elevation type.
Revegetation: Excellent results from standard pasture grasses, herbage production often double that of native grasses.
Silviculture: Moderately good site in lodgepole, good site in fir; lodgepole, Douglas-fir, white fir, larch can be grown; stockability is 80-105 sq.fr.. B.A. for lodgepole for 15 rings per inch growth of crop trees; clearcut to maintain lodgepole or larch; dense shelterwood for fir or overstory removal, ash soils scarify easily providing good seed bed for lodgepole, lodgepole easier to maintain than conversion to fir; regeneration is generally easy.
Indicators: Lodgepole indicates successional community, pinegrass indicates climax in WHITE FIR - FORB, grouse huckleberry indicates climax in WHITE FIR - GROUSE HUCKLEBERRY; tree productivity increases from south to north in Blue Mountains.

Fir saplings, dying pine

PRODUCTIVITY (9 plots)

	Herbage	Site Index LP	DF	WF	TBA	GBA	Cu. Ft. Per Yr.
Mean	274 lbs	40	82	52	121	93	45
5% level	47 lbs	7	8	6	41	22	12

RANGE CONDITION *
(Decreasers: pinegrass)
Good: 60% cover or xx + plants
Fair: 30-59% or xx-xx plants
Poor: 2-29% or xx-xx plants
V. Poor: **no decreasers**
* Decrease % cover 4% for each 10% increase in fir cover over 30%.

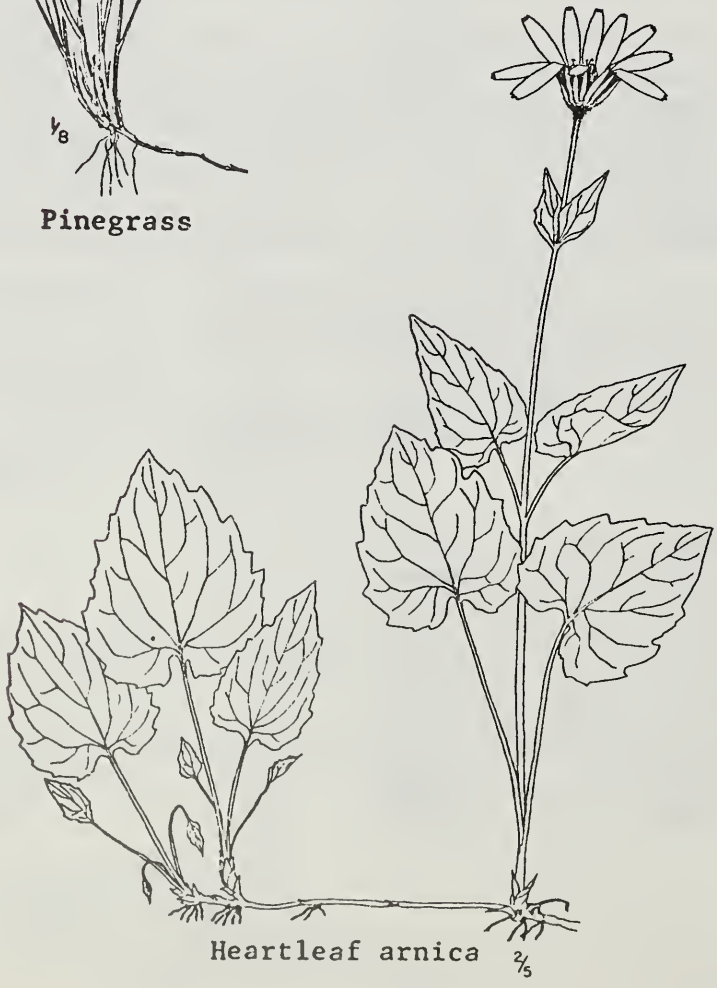


5 dm ash (20"), 8 dm (32") residual soil

Pinegrass

V. membranaceum
Big huckleberry

White hawkweed



Heartleaf arnica

Grouse huckleberry

LODGEPOLE - BIG HUCKLEBERRY CL-S5-11
(Pinus contorta - Vaccinium membranaceum) (7LM)

Range Condition Guide: none - not a livestock type
Tree Stocking Guide :
Silviculture Guide :

Pure lodgepole-huckleberry

ENVIRONMENT
Slope position: low to top
Aspect: northerly (southerly)
% slope: 2-20 (80)
Elevation: 4500-6500
Topography: undulating - steep

SOILS pumice ash over soils from
Geology: any parent material
Total depth: 36-48" (60)
Effective depth: 30-48" (60)
Stonyness: 0-40%
Texture: fine loamy sand
Structure: none to weak
Special: soil subject to wind erosion when disturbed, high infiltration, non-wettable.

VEGETATION

Dominants	% Cover	Status
Lodgepole pine	40-60 (70)	Successional to firs, fire species
White(grand) fir	0-20	Climax species, generally reprod.
Big huckleberry	20-60	Used by elk, denser in south Blues
Grouse huckleberry	0-20 (40)	At upper elevations, colder sites
Pinegrass	0-40 (80)	Lower, warmer sites

White fir saplings

Ground vegetation: Type not generally used by livestock, no range condition. Ground vegetation dominated by big huckleberry with grouse huckleberry at upper elevations or on colder sites and pinegrass at lower elevations and warmer sites. White fir, Douglas-fir reproduction often present; Englmann spruce and sub-alpine fir reproduction increase with increasing elevation.
Revegetation: Following logging or other ground disturbance, successful with standard pasture grasses; good production.
Silviculture: Moderately good site for lodgepole, good site in fir; lodgepole, larch, rust resistant white pine can be grown as pioneer species; Douglas-fir, white fir, Englemann spruce, sub-alpine fir can be grown; stockability for pine is 70-90 sq.ft. B.A. for 15 rings per inch growth of crop trees; clearcut to maintain lodgepole, larch, plant white pine; shelterwood often disturbs enough soil to encourage lodgepole reproduction; conversion from pine to fir more difficult than maintenance of pine - requires control of pine reproduction and shelterwood for fir; regeneration, except in large clearcuts, is generally easy.
Indicators: Lodgepole indicates successional community.

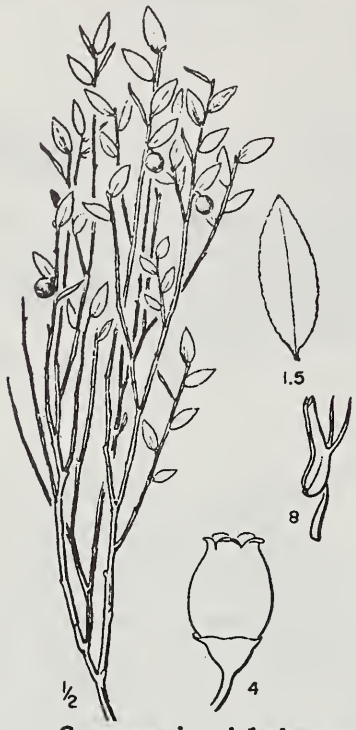
Sub-alpine fir seedlings

PRODUCTIVITY (11 plots)

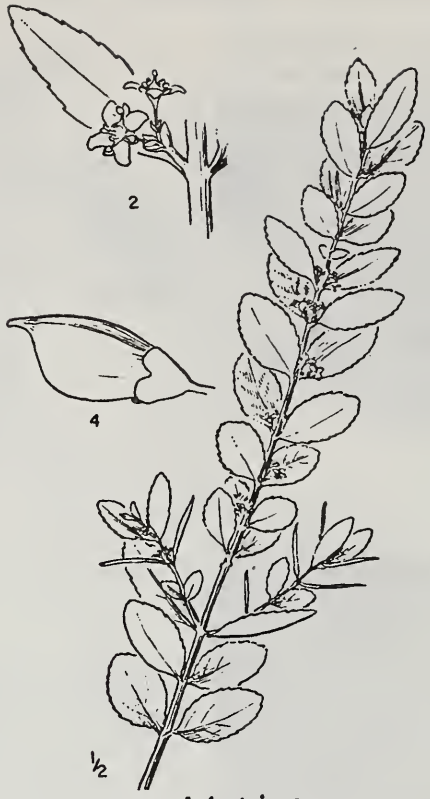
	Herbage	Site Index LP	WL	WF	TBA	GBA	Cu. Ft. Per Yr.
Mean	200 lbs	31	40	57	143	82	33
5% level	89 lbs	6	3	9	23	27	11

5 dm ash (20"), 4-5 dm (16-20") residual soil

RANGE CONDITION (not applicable)
(Decreasers:
Good:
Fair:
Poor:
V. Poor: no decreasers

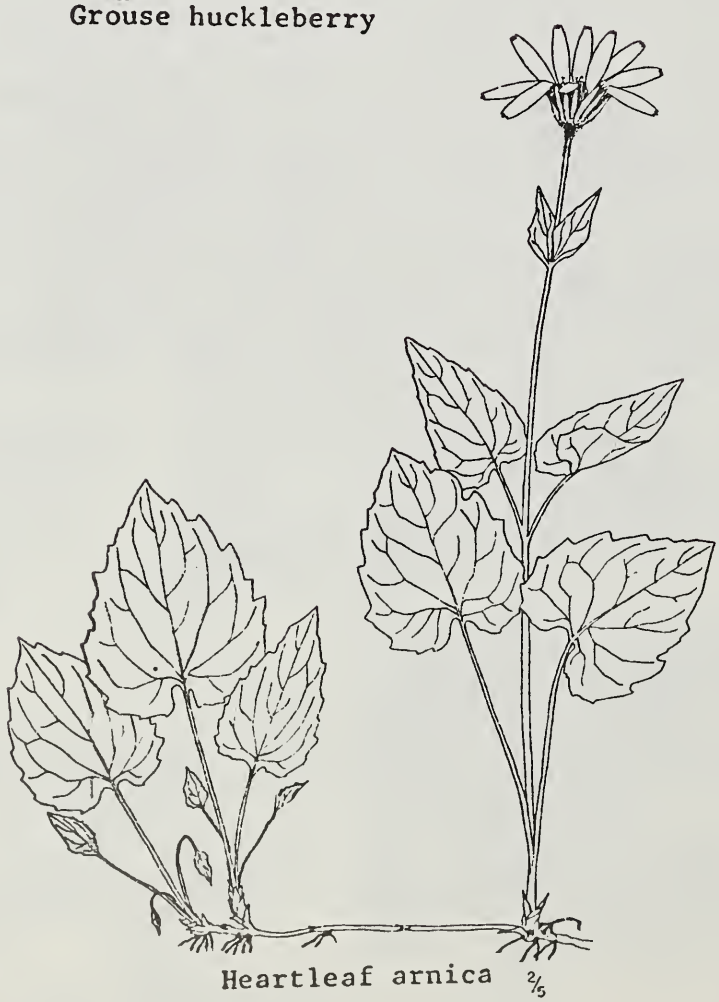


Grouse huckleberry

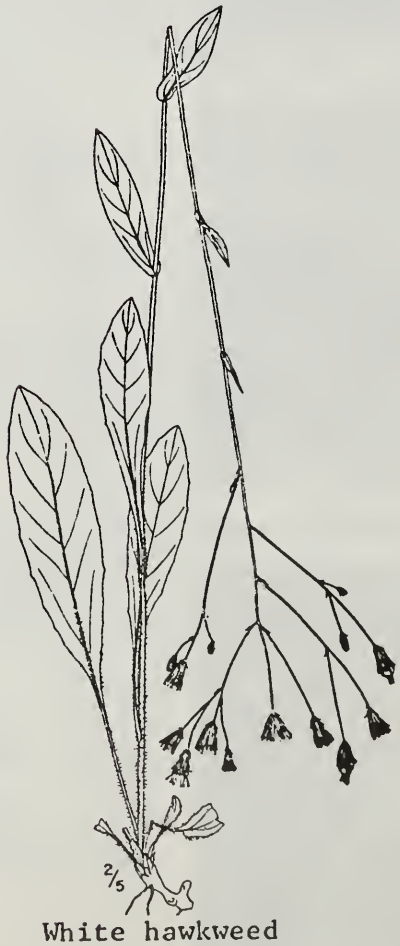


Pachistima

Pachistima myrsinites



Heartleaf arnica



White hawkweed

LODGEPOLE - GROUSE HUCKLEBERRY CL-S4-11
(Pinus contorta - Vaccinium scoparium) (7LS)

Range Condition Guide: None - not a livestock type.
Tree Stocking Guide :
Silviculture Guide :

ENVIRONMENT
Slope position: low to top
Aspect: northerly
% slope: 2-20 (80)
Elevation: 5500-7500 (5000)
Topography: dissected, rolling to steep

SOILS Generally ash over old
Geology: soil (deep residual)
Total depth: 36-60" (24)
Effective depth: 20-60" (14)
Stonyness: 20-40% (0)
Texture: fine loamy sand
Structure: none to weak
Special: wind erodible when exposed, moderate to severe non-wettability.

Subalpine fir reproduction

VEGETATION

Dominants	% Cover	Status
Lodgepole pine	30-60	Successional to firs, fire species
Sub-alpine fir	0-40	Climax, generally reproduction
Engelmann spruce	0-20	Climax, generally reproduction.
Grouse huckleberry	15-50 (80)	Some use by big game
Heartleaf arnica	0-8	Major forb

Ground vegetation: Type seldom used by livestock due to lack of forage. Ground vegetation dominated by grouse huckleberry with very few herbaceous plants - both cover and kinds of species very low. Key indicator difference between this type and LODGEPOLE - PINEGRASS - GROUSE HUCKLEBERRY CL-G2-11 in poor condition is the lack of variety and cover of herbs in this type. Those present are white hawkweed, arnica, and a dwarf shrub form of pachistima.
Revegetation: Only moderate to poor success due to cold soils and short growing seasons; use cold hardy plants.
Silviculture: Moderately good site for lodgepole, fair sub-alpine fir site (poor compared to white fir); lodgepole is a pioneer species, white fir can be grown at lower elevation where some pinegrass and increased density of forbs indicate warmer soils, Engelmann spruce and sub-alpine fir at upper elevations; stockability for pine is 65-90 sq.ft. B.A. for 15 rings per inch growth of crop trees; clearcuts generally are very difficult to regenerate even with lodgepole due to cold air settlement and frost heaving; shelterwood often results in dominance of lodgepole seedlings due to seed source and their rapid growth; overstory removal best for conversion to fir and spruce.

Spruce and fir saplings

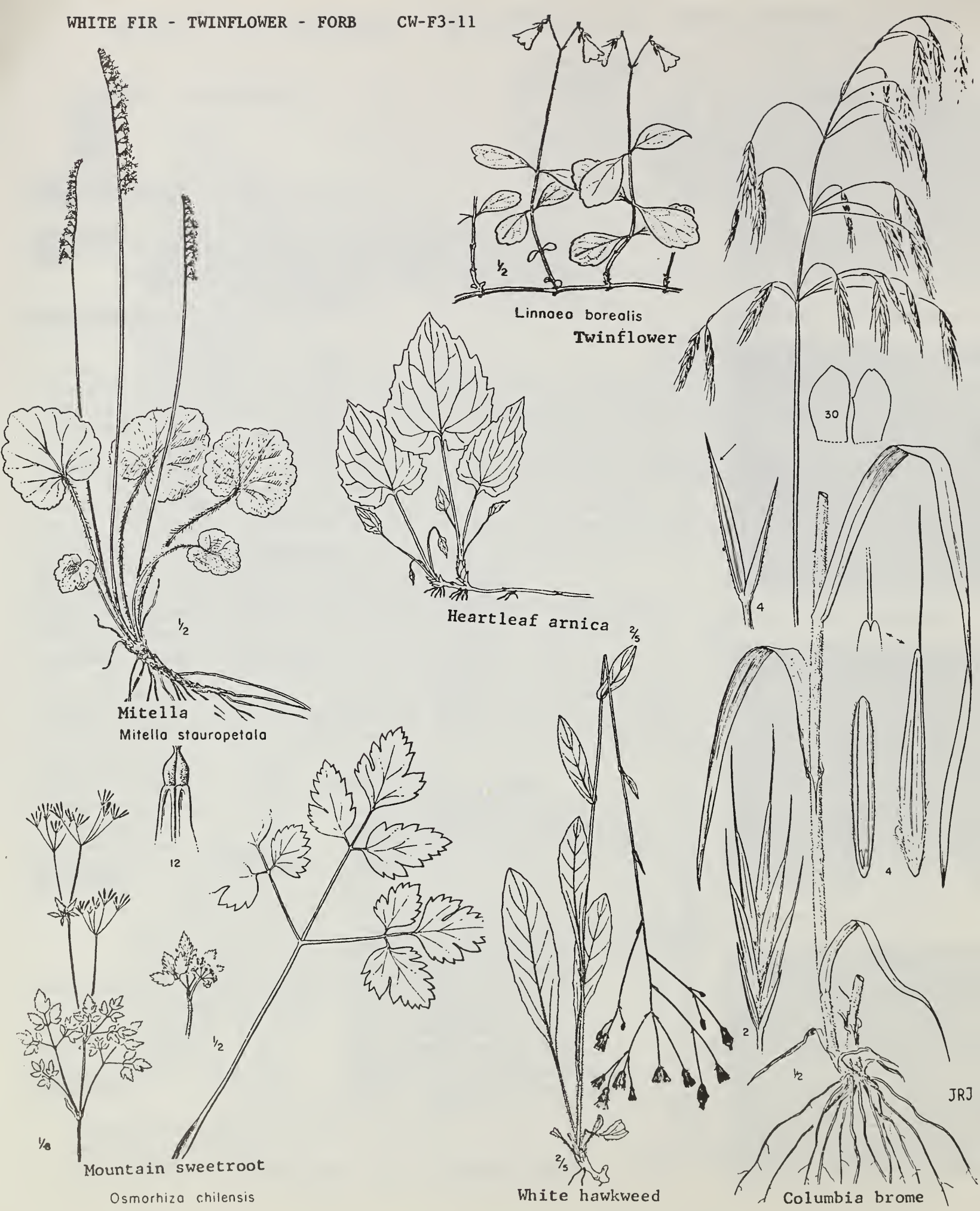
Lodgepole, fir, and spruce

PRODUCTIVITY (13 plots)

	Herbage	Site Index LP	AF	ES	TBA	GBA	Cu. Ft. Per Yr.
Mean	116 lbs	35	30	42	171	78	35
5% level	40 lbs	9	6	6	51	13	9

RANGE CONDITION (not applicable)
(Decreasers:
Good:
Fair:
Poor:
V. Poor: no decreasers

3 dm mixed ash (12"), 4 dm (12") stony residual



WHITE FIR - TWINFLOWER - FORB CW-F3-11
(Abies grandis - Linnaea - forb) **(7WF)**

Range Condition Guide: None - not suitable for livestock
Tree Stocking Guide :
Silviculture Guide :

Larch overstory, fir seedings with pinegrass

Large fir poles, forbs

Climax fir, few forbs

5 dm ash (20"), 4 dm (16") residual soil

ENVIRONMENT (top)
Slope position: bottom to mid
Aspect: northerly
% slope: 5-40 (100)
Elevation: 2400 - 6500
Topography: rolling to steep

SOILS volcanic ash over soil
Geology: of all parent materials
Total depth: 40 - 60" (80)
Effective depth: 20-60"
Stonyness: 10 - 60% (0)
Texture: fine loamy sand
Structure: none to weak
Special: wind erodible when exposed, rapid infiltration, some non-wettability.

VEGETATION

Dominants	% Cover	Status
White(grand) fir	50-85 (5)	Climax species
Douglas-fir	0-25	Successional, near climax status
Larch	0-20 (50)	Successional, pioneer after fire
Twinflower	0-20	Lower elevations southerly
Columbia brome	5-25 (0)	Upper elevations, northerly
Forbs (see below)	5-25	Rich mixture of species

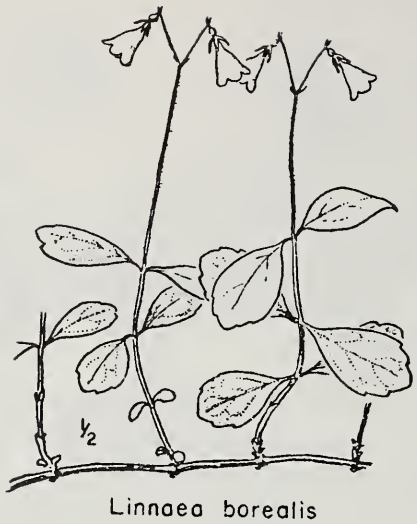
Ground vegetation: Density and composition of ground vegetation depends upon tree cover, elevation and aspect. Under a total of 70% tree cover (managed stand density), ground vegetation is dominated by twinflower at lower, southerly sites and by brome at higher, northerly sites with heartleaf arnica, broad leaved lupine, white hawkweed, California strawberry, mitella, pyrola, and mountain sweetroot. Shrubs are conspicuously absent or very restricted in occurance; occasional Pacific yew.
Revegetation: Excellent success with standard pasture grasses.
Silviculture: Best fir site in the Blue Mountains; can grow: Douglas-fir, white fir, larch, white pine, lodgepole pine, and Engelmann spruce at upper elevations, ponderosa pine does not seem adapted to the site; stockability for firs is 165-205 sq. ft. B.A. for 15 rings per inch growth of crop trees; clearcuts are best planted to larch or lodgepole(Douglas-fir has not been very successfull), shelterwood best for fir regeneration; regeneration is easiest in the Blues, often excessive establishment.
Indicators: Increasing elevation and change to north slopes associated with increasing brome, decreasing twinflower; increasins slope and change from north to south with increasing c.f. production.

PRODUCTIVITY (15 plots)

	Herbage	Site Index WF	DF	WL	TBA	GBA	Cu. Ft. Per Yr.
Mean	208 lbs.	55	80	51	202	185	115
5% level	951bs.	4	10	6	35	22	22

RANGE CONDITION (Not applicable)
(Decreasers:
Good: % cover or + plants
Fair: - % or - plants
Poor: - % or - plants
V. Poor: no decreasers

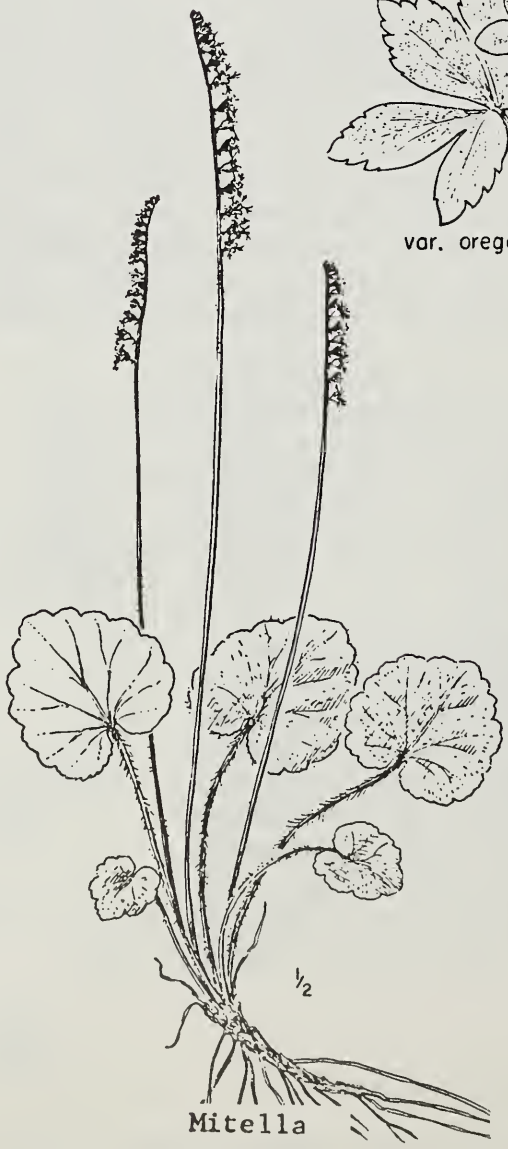
V. membranaceum
Big huckleberry



Linnaea borealis
Twinflower

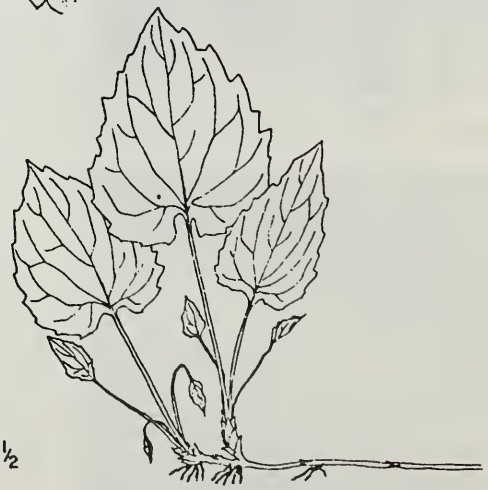
Chimaphila umbellata
Pipsissewa

Pinegrass



Mitella

Oregon anemone



Heartleaf arnica

WHITE FIR - BIG HUCKLEBERRY CW-S2-11
(Abies grandis - Vaccinium membranaceum) (7WM)

Range Condition Guide: (none - not suitable for livestock)
Tree Stocking Guide :
Silviculture Guide :

ENVIRONMENT
Slope position: bottom to upper
Aspect: all aspects (northerly)
% slope: 5-110
Elevation: 3500 - 6500
Topography: rolling to rough

SOILS largely volcanic ash
Geology: over soil, (residual)
Total depth: 36-60" (100) (24)
Effective depth: 24-60" (14) (110)
Stonyness: 15-50% (0)
Texture: fine loamy sand (loam)
Structure: none to weak
Special: all ash wind erodible when exposed, rapid infiltration but significantly non-wettable.

VEGETATION

Dominants	% Cover	Status
White (grand) fir	50-85 (5)	Climax dominant
Douglas-fir	0-25 (40)	Successional, minor climax at lower elevations
Larch	0-30 (40)	Successional, pioneer after fire
Ponderosa pine	0-20	Successional, lower elevation only
Engelmann spruce	0-60	Minor climax, upper elevation only
Big huckleberry	5-40 (80)	Major ground vegetation species

Ground vegetation: Density and composition of ground vegetation depends upon density of tree cover. Presence of white fir and big huckleberry and absence of grouse huckleberry indicate this type; forb density is directly related to tree cover but variety of forb species remains extremely diverse. Under 70% tree cover (managed stand density) big huckleberry is 35% cover with heartleaf arnica, mitella, pyrola, some pinegrass, twinflower, anemone, pipsissewa, and occassional Pacific yew.
Revegetation: Excellent success with standard pasture grasses.
Silviculture: Good fir site; can grow white fir, Douglas-fir, larch, lodgepole, white pine, ponderosa pine at lower elevation and Engelmann Spruce at higher elevations; stockability for firs is 125-155 sq.ft. B.A. for 15 rings per inch growth of crop trees; clearcuts best planted to larch or lodgepole (ponderosa lower), shelterwood best for fir regeneration; regeneration easy; broadcast burning may increase non-wettability of soil.
Indicators: increasing elevation associated with decreasing ponderosa, increasing larch and Engelmann spruce, decreasing white fir; c.f. production increases from south to north in Blue Mountains.

PRODUCTIVITY (17 plots)

	Herbage	Site Index WF	Site Index DF	Site Index PP	TBA	GBA	Cu. Ft. Per Yr.
Mean	301	54	71	73	181	142	79
5% level	67	4	7	5	21	17	12

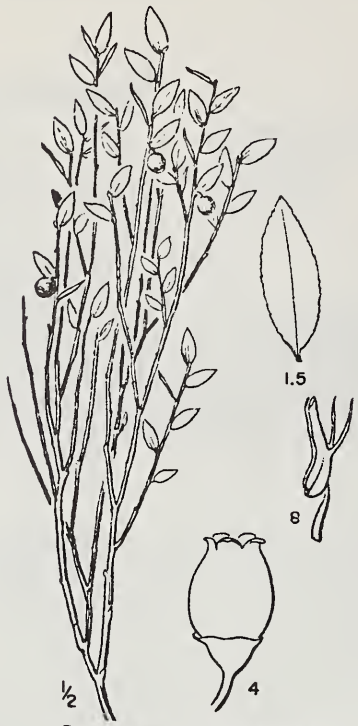
RANGE CONDITION (Not applicable)
(Decreasers:
Good: % cover or + plants
Fair: - % or - plants
Poor: - % or - plants
V. Poor: no decreasers

Larch overstory, fir poles

Open fir poles, huckleberry

Moderately dense fir

2 dm mixed ash (8"), 8 dm residual soil (32")



Grouse huckleberry

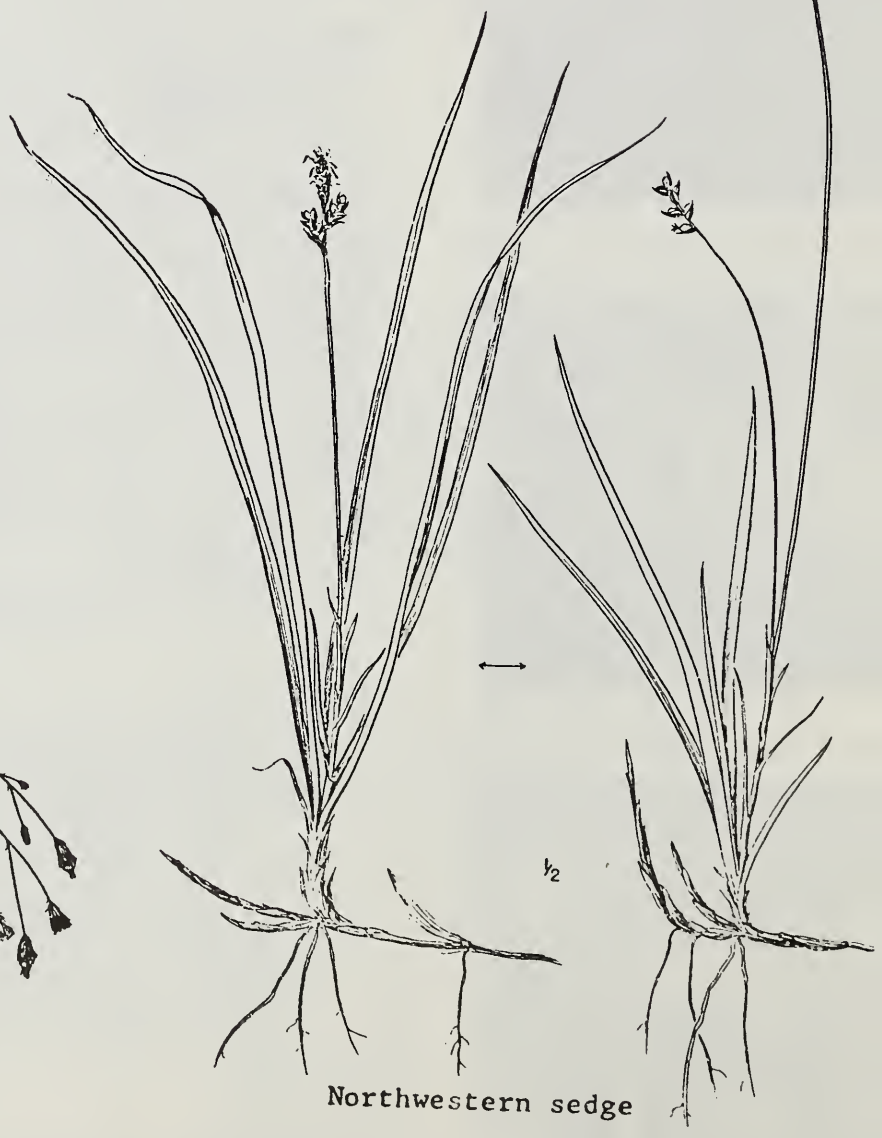
Chimaphila umbellata

Pipsissewa

Pinegrass

White hawkweed

H. albiflorum



Northwestern sedge

C. concinnoides

WHITE FIR - GROUSE HUCKLEBERRY CW-S8-11
(Abies grandis - vaccinium scoparium) (7WS)

Range Condition Guide: none - not suitable for livestock
Tree Stocking Guide :
Silviculture Guide :

Down ponderosa, pinegrass with grouse huckleberry

ENVIRONMENT

Slope position: low to top
Aspect: northerly (southerly)
% slope: 5-80 (110)
Elevation: 4500 - 6500
Topography: rolling to rough

SOILS

Volcanic ash over soils
Geology: of various materials
Total depth: 30-50" (60)
Effective depth: 24-48" (60)
Stonyness: 20-50% (0)
Texture: fine loamy sand
Structure: none to weak
Special: ash wind erodible when exposed, rapid infiltration, significantly non-wettable

Pole sized fir, huckleberry

VEGETATION

Dominants	% Cover	Status
White (grand) fir	40-60 (80)	Climax dominant
Douglas-fir	3-25 (40)	Near climax status
Larch	0-7 (30)	Pioneer species after fire
Grouse huckleberry	20-40 (50)	Key indicator, ground dominant
Pinegrass	5-40 (60)	Decreaser, decreases with elevation

Ground vegetation: Density and composition of ground vegetation directly related to tree cover. Presence of white fir and grouse huckleberry without significant sub-alpine fir and big huckleberry are key indicators of the type. Under 70% tree cover (managed stand density): grouse huckleberry 35%, pinegrass 20%, with white hawkweed, pipsissewa, northwestern sedge, and pyrola.
Revegetation: Good succuss with standard pasture grasses.
Silviculture: Fair fir site; can grow white fir, Douglas-fir, larch, lodgepole, ponderosa pine at lower elevations, Englemann spruce at upper elevations; stockability for firs is 110-150 sq. ft. B.A. for 15 rings per inch growth of crop trees; clearcuts best planted to lodgepole or larch (ponderosa lower) shelterwood for fir regeneration; regeneration moderately easy; grouse huckleberry indicates colder soils and cold air drainage which may cause frost heaving and damage in clearcuts; broadcast burning may increase non-wettability of soil.
Indicators: Increasing elevation associated with decreasing ponderosa, increasing Engelmann spruce; grouse huckleberry suggests colder soils, cold air drainage at lower elevations.

Dense north slope fir

PRODUCTIVITY (6 plots)

	Herbage	Site Index WF	DF	PP	TBA	GBA	Cu. Ft. Per Yr.
Mean	2481bs.	42	70	64	146	129	59
5% level	1331bs.	20	22	10	43	48	30

RANGE CONDITION (Not applicable)

(Decreasers:

Good:		% cover or		+ plants
Fair:	-	% or	-	plants
Poor:	-	% or	-	plants
V. Poor:	no decreasers			

3 dm ash (12"), 8 dm (32") gravelly residual soil

White hawkweed

H. albiflorum

V. membranaceum

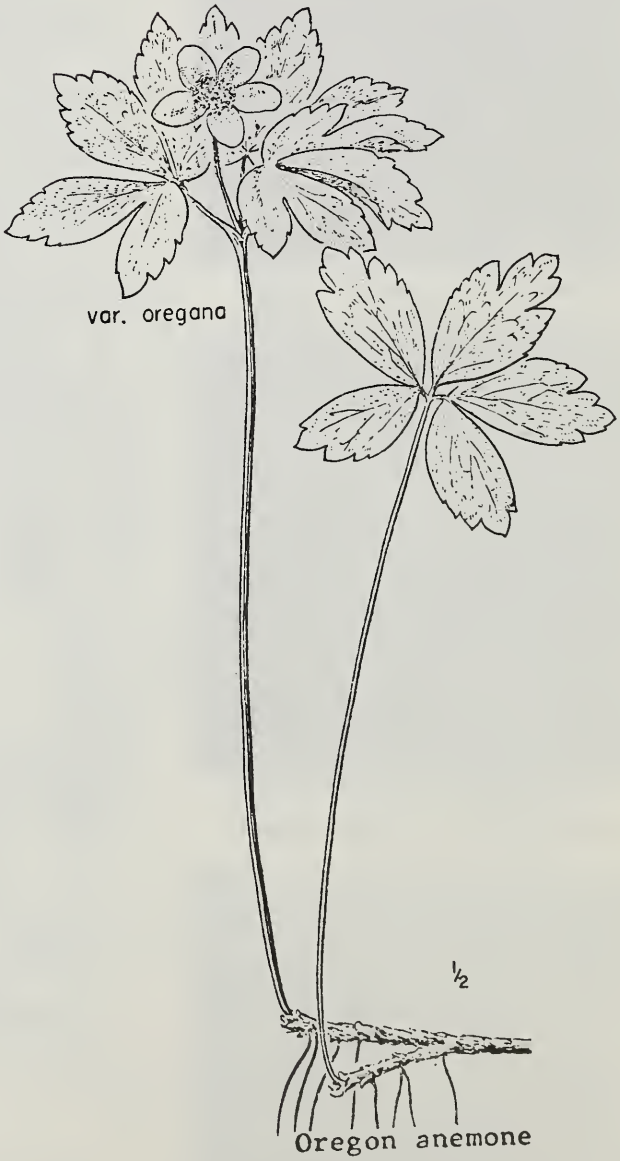
Big huckleberry

Chimaphila umbellata

Pipsissewa

Heartleaf arnica

A. cordifolia



Oregon anemone

A. oregana

SUB-ALPINE FIR - BIG HUCKLEBERRY CE-S3-11
(Abies lasiocarpa - Vaccinium membranaceum) (7AM)

Range Condition Guide: None - not suitable for livestock
Tree Stocking Guide :
Silviculture Guide :

ENVIRONMENT
Slope position: Top to mid(low)
Aspect: northerly (southerly)
% slope: 5-60 (120)
Elevation: 4500 - 6500
Topography: rolling to rough

SOILS Volcanic ash over soil
Geology: of all parent material
Total depth: 36-48" (24)
Effective depth: 24-48"
Stonyness: 0-40%
Texture: fine loamy sand
Structure: none to weak
Special: ash wind erodible when exposed, rapid infiltration, quite non-wettable.

VEGETATION

Dominants	% Cover	Status
Sub-alpine fir	40-80(20)	Climax dominant
Engelmann spruce	10-20(0)	Climax associate
Larch	0-20	Successional, pioneer after fire
Big huckleberry	10-40(80)	Key indicator, ground dominant

Ground vegetation: Density and composition of ground vegetation directly related to tree cover. Presence of sub-alpine fir and big huckleberry with little or no grouse huckleberry are key indicators of the type. Under 60% tree cover (managed stand density): big huckleberry 30% cover with heartleaf arnica, white hawkweed, mitella, pipsissewa, anemone.
Revegetation: Good success with standard pasture grasses.
Silviculture: fair fir site; can grow sub-alpine fir, Engelmann spruce, larch, lodgepole, white fir at lower elevations; stockability for fir and spruce is 100-140 sq.ft. B.A. for 15 rings per inch growth of crop trees; shelterwood cutting preferred for fir and spruce as well as larch; shelterwood for larch will result in significant fir reproduction; clearcuts have been problems, even when planted with lodgepole - plant with lodgepole or larch; sub-alpine fir indicates colder climate and shorter growing seasons which often combine with snow drifting to make clearcutting tenuous; broadcast burning may increase non-wettability of the soil.
Indicators: Sub-alpine fir indicates colder climate and short growing seasons; big huckleberry indicates warmest soils in upper forest zone and best opportunities for regeneration.

PRODUCTIVITY (7 plots)

	Herbage	Site Index AF	Site Index ES	Site Index WL	TBA	GBA	Cu. Ft. Per Yr.
Mean	292 lbs.	28	38	(46)	160	120	55
5% level	170 lbs.	9	6	xx	13	18	13

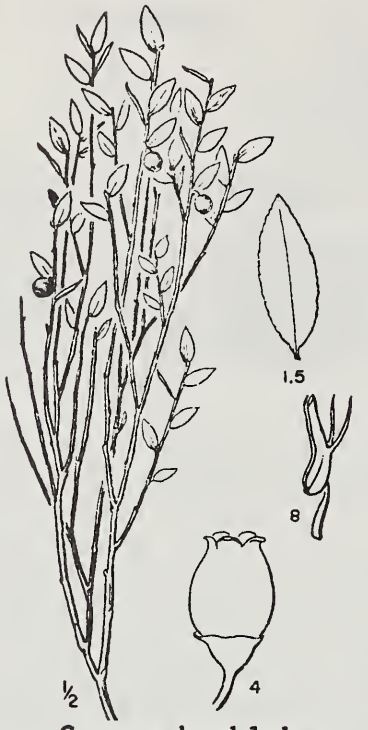
RANGE CONDITION (not applicable)
(Decreasers:
Good: % cover or + plants
Fair: - % or - plants
Poor: - % or - plants
V. Poor: **no decreasers**

Larch overstory with sub-alpine fir saplings

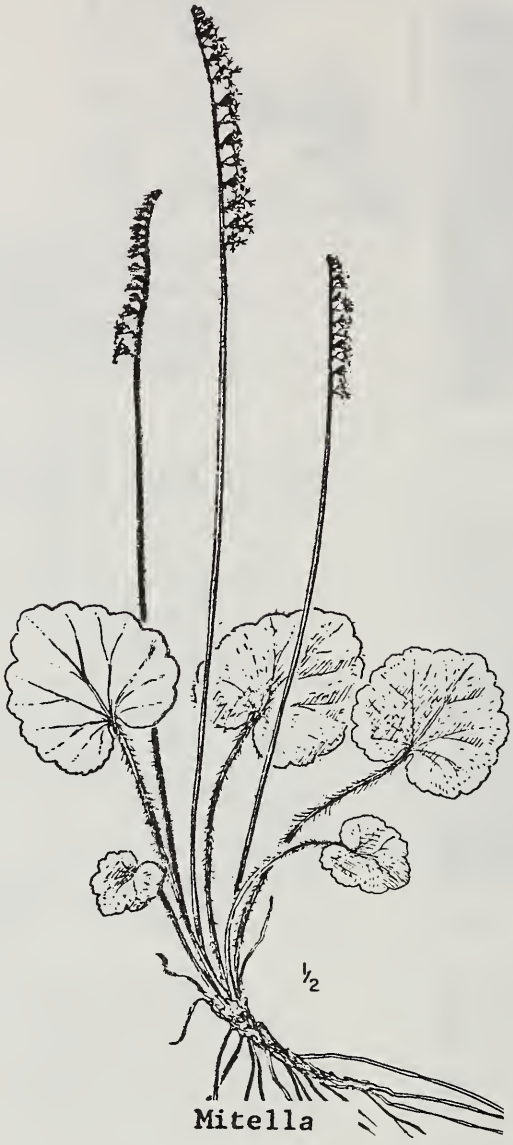
Pole sized sub-alpine fir

Dense sub-alpine fir

5½ dm ash (22"), 6 dm (24") buried soil



Grouse huckleberry

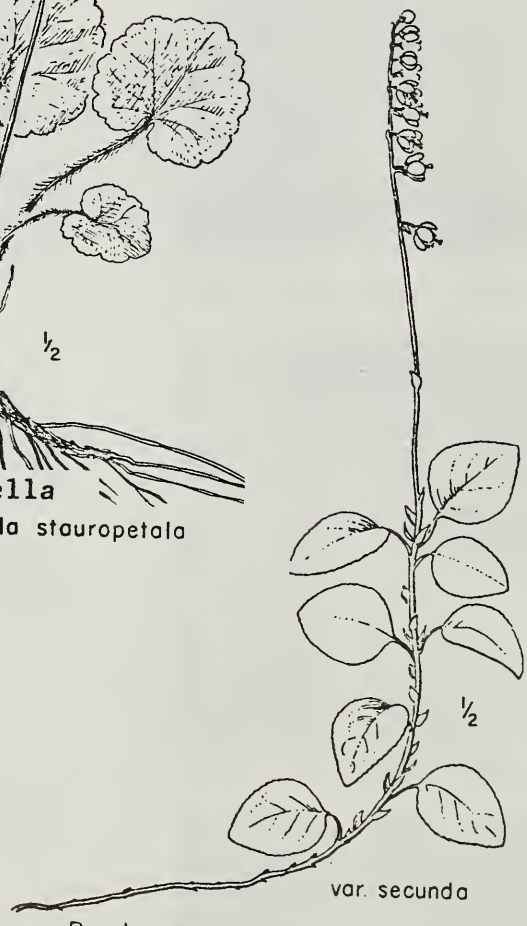


Mitella

Mitella stauropetala

Pachistima

Pachistima myrsinites



Pyrola secunda

Pyrola

SUB-ALPINE FIR - GROUSE HUCKLEBERRY CE-S4-11
(Abies lasiocarpa - Vaccinium scoparium) (7AS)

Range Condition Guide: None - not suitable for livestock
Tree Stocking Guide :
Silviculture Guide :

Typical ground vegetation

ENVIRONMENT
Slope position: mid to top
Aspect: northerly
% slope: 5-50 (100)
Elevation: 6000-7500
Topography: rolling to rough

SOILS largely volcanic ash
Geology: over soil (residual)
Total depth: 36-48" (24)
Effective depth: 24-48"
Stonyness: 20-40% (0)
Texture: fine loamy sand
Structure: none to weak
Special: ash wind erodible when exposed, often severely non-wettable.

VEGETATION

Dominants	% Cover	Status
Sub-alpine fir	40-60 (15)	Climax dominant
Engelmann spruce	0-40	Climax associate, lower elevations
Grouse huckleberry	10-40 (60)	Key indicator, ground dominant

Sub-alpine fir poles, down lodgepole pine

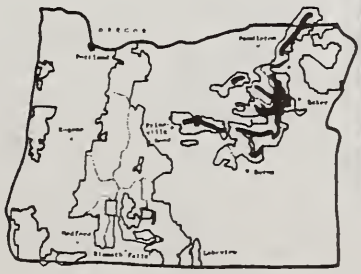
Ground vegetation: Density and composition of ground vegetation directly related to tree cover. Presence of sub-alpine fir and grouse huckleberry with little or no white fir or big huckleberry are key indicators of the type. Under 50% tree cover (managed stand density): grouse huckleberry is 35% cover with low cover of only a few herbs such as a dwarf shrub form of pachistima, mitella, pyrola, white hawkweed.
Revegetation: difficult, moderate to poor success due to cold soils and short growing season, use cold hardy plants.
Silviculture: fair to poor fir site; can grow only sub-alpine fir, Engelmann spruce and lodgepole pine with success (larch and Douglas-fir can occassionally be found); stockability for fir and spruce is 60-100 sq.ft. B.A. for 15 rings per inch growth of crop trees (often not possible at highest elevations); do not clearcut - cold soils, cold climate and cold air settlement combine to frost heave and frost kill trees, use moderately dense shelterwood, do not scarify the soil (causes frost heaving) and plant lodgepole, spruce or sub-alpine fir; regeneration is difficult to tenuous; broadcast burning should be discouraged - increases non-wettability, reduces duff and litter thus increasing frost heaving.
Indicators: Sub-alpine fir and grouse huckleberry indicate coldest climate and soil for commercial forest - problems.

Near climax fir and spruce

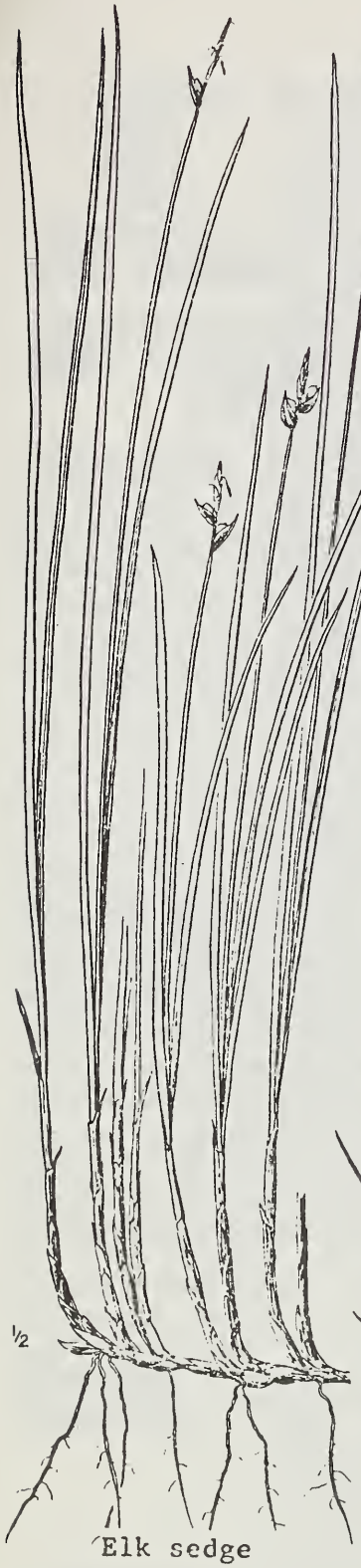
PRODUCTIVITY (4 plots)

	Herbage	Site Index AF	ES	LP	TBA	GBA	Cu. Ft. Per Yr.
Mean	181 lbs	22	(30)	30	137	85	29
5% level	131 lbs	6	xx	5	87	15	4

RANGE CONDITION (Not applicable)
(Decreasers:
Good: % cover or + plants
Fair: - % or - plants
Poor: - % or - plants
V. Poor: no decreasers



6 dm mixed ash (24"), 4 dm buried soil (16")



Elk sedge

C. geyeri

Needlegrass

S. occidentalis

Sandwort

Arenaria capillaris

A. tridentata

Alpine sagebrush

Pokeweed fleeceflower

P. phytolaccaefolium

SUB-ALPINE FIR - WHITEBARK PINE - SEDGE CA-G1
(Abies lasiocarpa - Pinus albicaulis - Carex geyeri) (7AP)

Range Condition Guide: R6-2210-29
Tree Stocking Guide :
Silviculture Guide :

Eroded with fleeseflower

ENVIRONMENT
Slope position: mid to top
Aspect: all aspects (southerly)
% slope: 5-60 (180)
Elevation: 6800-8000
Topography: rolling to rough

SOILS Ash, lavas, tuff,
Geology: granitic, serpentine
Total depth: 24-48"
Effective depth: 12-36"
Stonyness: 30-60%
Texture: sandy loam to loam
Structure: none to weak (moder.)
Special: eroadible from high winds at exposed locations.

VEGETATION

Dominants	% Cover	Status
Sub-alpine fir	5-30	Climax co-dominant, lower elevation
Whitebark pine	5-30	Climax co-dominant, higher elevat.
Elk sedge	40-80 (0)	Climax ground plant, mostly gone
Alpine sagebrush	0-5	Climax?, present in poor condition
Sandwort	0-10	Invader following erosion
Fleeseflower	0-30	Invader following erosion
Needlegrass	0-10	Increaser, little to no erosion

Needlegrass and lodgepole

Good Range Condition: Scattered pine and fir, ground dominated by closed sod of elk sedge, possibly with some alpine sagebrush. In most cases this condition is not found; instead over grazing has eliminated the sedge and the surface soil (A horizon) has been eroded away.
Poor Range Condition: Two basic conditions, complete A horizon loss or partial loss. When the entire A horizon has been lost, pokeweed fleeseflower dominates and the site can not be judged by condition standard R6-2210-29 because the site has changed and no longer has elk sedge potential. Non-eroded conditions are dominated by needlegrass and squirreltail with some alpine sagebrush; eroding conditions (partical A horizon loss) often have pokeweek fleeseflower and sandwort growing on the exposed B horizon which may have a covering of erosion pavement.
Revegetation: unsuccessful due to cold soil and short growing season.
Silviculture: Non commercial forest type; an upper elevation "savanna" due to cold soil and short growing season.

Climax whitebark pine-sedge

PRODUCTIVITY (* plots) *3 timber, 10 range

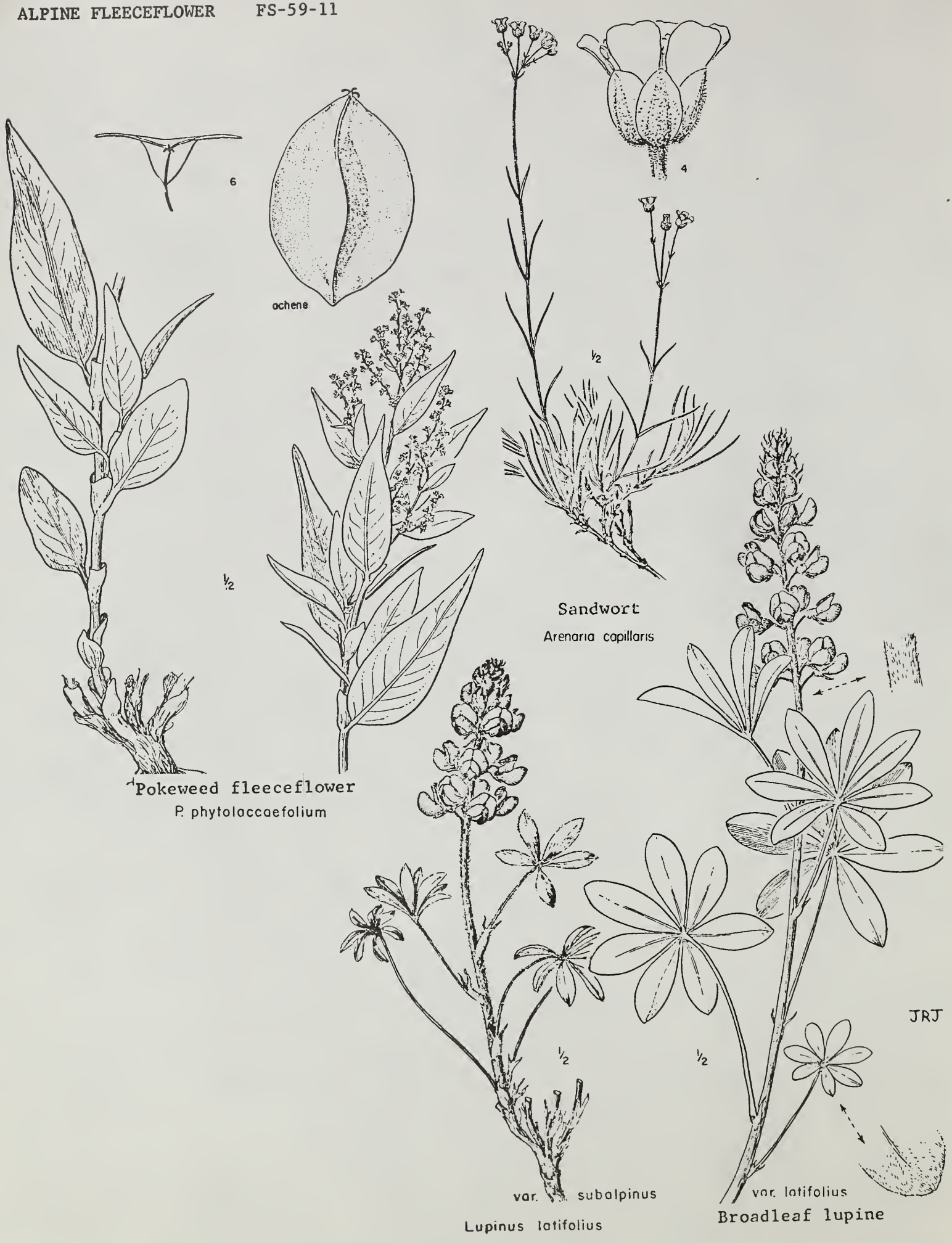
	Herbage	Site Index AF	Site Index LP		TBA	GBA	Cu. Ft. Per Yr.
Mean	273 lbs	(24)	(25)		xx	xx	xx
5% level	122 lbs						

6½ dm. = 26"

RANGE CONDITION
(Decreasers: elk sedge)
Good: 70 % cover or xx + plants
Fair: 35-69% or xx - xx plants
Poor: 2-34% or xx - xx plants
V. Poor: **no decreasers**

SUB-ALPINE FIR - WHITEBARK PINE - SEDGE CA-G1

ALPINE FLEECEFLOWER FS-59-11



ALPINE FLEECEFLOWER FS-59-11
(Polygonum phytolaccaeflium alpine) (3P)

Range Condition Guide: **none**

ENVIRONMENT

Slope position: **upper - top**
Aspect: **southerly (northerly)**
% slope: **0-40 (80)**
Elevation: **6000 - 8200**
Topography: **Rolling to rough**

SOILS

Geology: **granitic, lava**
Total depth: **20-40 inches**
Effective depth: **10-30 inches**
Stonyness: **30-60% (0)**
Texture: **sandy loam to loam**
Structure: **weak to moderate**
Special: **eroded A horizon; only B horizon remaining**

VEGETATION

Dominants	% Cover	Status
Pokeweed fleeceflower	**45-60**	**Apparently now climax due to erosion of A horizon**
Sandwort	**1-10 (20)**	**Apparently climax, in interspaces holding soil**
Broadleaf lupine		**Decreaser**

This type is not "natural" for any of the Blue Mountains--it is the result of excessive soil erosion on the Artemisia tridentata var. vasyana - Carex community type or the Carex geyeri - Carex hoodii type. It should be mapped separately due to the major site change caused by erosion.

CHARACTERISTICS

	Herbage	Surface Rock	Erosion Pavement	Bare Ground	Moss
Mean	**? lbs**				
5% level					

RANGE CONDITION

(Decreasers: **unknown**
Good:
Fair:
Poor:
V. Poor:

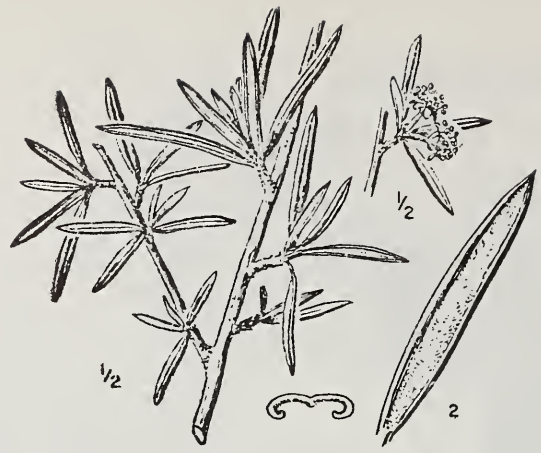
Fleeseflower invading

Fleesflower and stony soil

Fleeseflower on granitics

18 cm. = 7 inches loss!

ALPINE FLEECEFLOWER FS-59-11



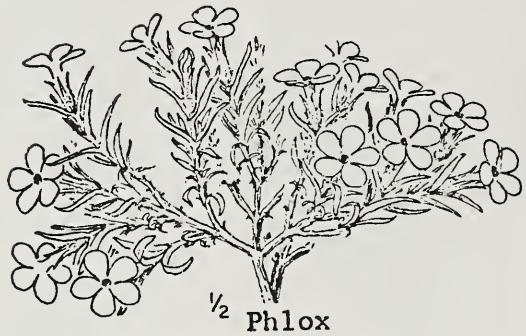
var. intercedens

Cercocarpus ledifolius

Mountainmahagony

A. tridentata

Alpine sagebrush



Phlox

P. diffusa var. longistylis

Elk sedge

C. geyeri

Piper buckwheat

E. flavum

Pokeweed fleeceflower

P. phytolaccaefolium

ALPINE SAGEBRUCH - SEDGE SS-49-11
(Artemisia tridemtata var. vaseyana - Carex geyeri) **(4TA)**

Range Condition Guide: Alpine openings R6-2210-29

Fleeseflower invading

ENVIRONMENT
Slope position: mid-top(low)
Aspect: southerly(northerly)
% slope: 5-30 (80)
Elevation: 6100-8200
Topography: rolling to rough

SOILS
Geology: lavas, granitics
Total depth: 20-36 inches
Effective depth: 7-23 inches
Stonyness: 25-60 (0)
Texture: sandy loam - loam
Structure: weak to moderate
Special: A horizon subject to erosion.

VEGETATION

Dominants	% Cover	Status
Alpine sagebrush	7-25 (40)	Climax shrub, increaser
Elk sedge	40-60 (80)	Decreaser
Yarrow	1-5	Increaser

Poor condition alpine sage

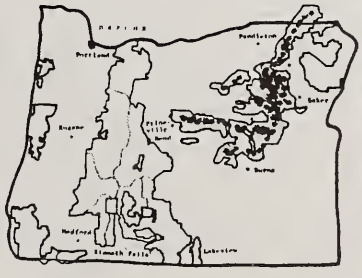
Good condition: Sagebrush is moderately scattered with an unbroken sod of elk sedge and occasional yarrow. Mountain-mahogany may be present.
Poor condition: characterized by two conditions - non eroded A horizon and eroding A horizon (When the entire A horison is gone, sagebrush dominates with sweetroots, phlox, and some needlegrass. The site has changed and it should not be classed in this type). None-eroded conditions are dominated by sagebrush with needlegrass, phlox, squirreltail and little erosion pavement. Eroding conditions often have erosion pavement in the active erosion with pokeweed fleeceflower, phlox, and sandwort.
Revegetation: Generally not successful due to cold soils and short growing season which are inimical to domestic grasses.
Indicators: granitic soils - more erosion, fleeceflower, sandwort. Lava soils - more herbage production, less erosion, some possible chance of revegetation below 6500 feet elevation.

Good condition alpine sage

CHARACTERISTICS (13 plots)

	Herbage	Surface Rock	Erosion Pavement	Bare Ground	Moss
Mean	383 lbs	7 %	10 %	3 %	0 %
5% level	48 lbs	8 %	8 %	3 %	%

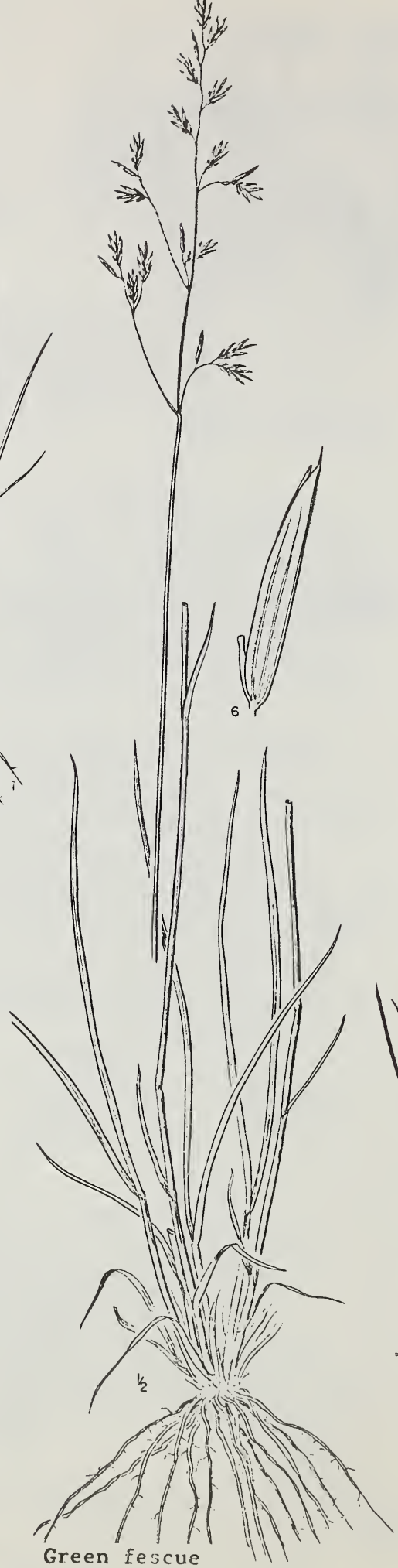
RANGE CONDITION
(Decreasers:
Good: 60% cover or xx + plants
Fair: 30-59% or xx-xx plants
Poor: 2-29% or xx-xx plants
V. Poor: no decreasers



ALPINE FESCUE GS-12-11

Ross sedge
C. rossii

Achillea millefolium
Yarrow



Green fescue

Idaho fescue

ALPINE FESCUE GS-12-11 (Alpine Festuca) (1AF)

Range Condition Guide: **Alpine openings R6-2210-29**

Green fescue, best found

ENVIRONMENT
Slope position: **mid to top**
Aspect: **northerly (southerly)**
% slope: **5 - 25 (45)**
Elevation: **6500-8200 (6000)**
Topography: **rolling to rough**

SOILS
Geology: **lavas**
Total depth: **14-38 inches**
Effective depth: **8-20 inches**
Stonyness: **25- 60 (80)**
Texture: **loams**
Structure: **moderate blocky**
Special: **A horizon subject to loss by erosion**

VEGETATION

Dominants	% Cover	Status
Fescue	**35-45 (60)**	**Decreaser, low in palatability**
Green fescue	**occasional**	**Ice cream plant**
Ross sedge	**3 - 15**	**Decreaser to increaser**
Yarrow	**3-6**	**Increaser**

Good condition fescue

Good condition is clearly dominated by fescue with very little else. Green fescue has been included because it is similar in form to alpine fescue and because no good condition green fescue stands could be found (in fact only three stands containing green fescue could be located).
Poor condition with no erosion is generally dominated by needlegrass and/or squirreltail. With erosion, fleece-flower and sandwort become dominant.
Revegetation has been unsuccessful due to cold soils and short growing seasons which are inimical to domestic grasses.

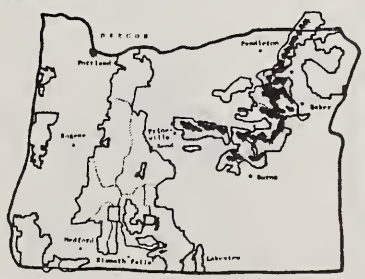
This type tends to intergrade with Alpine sedge and with Alpine sagebrush in the southern Blue Mountains.
Indicators: high elevation, exposed ridges, surrounding forest of subalpine fir and/or whitebark pine.

CHARACTERISTICS **(4 plots)**

	Herbage	Surface Rock	Erosion Pavement	Bare Ground	Moss
Mean	254 lbs	0%	0%	3%	12%
5% level	150 lbs			3%	6%

4½ dm. = 18 inches

RANGE CONDITION
(Decreasers: **alpine fescue, green fescue**)
Good: **50% cover or 15 + plants**
Fair: **25 - 49% or 7 - 14 plants**
Poor: **2 - 24% or 1 - 6 plants**
V. Poor: **no decreasers**



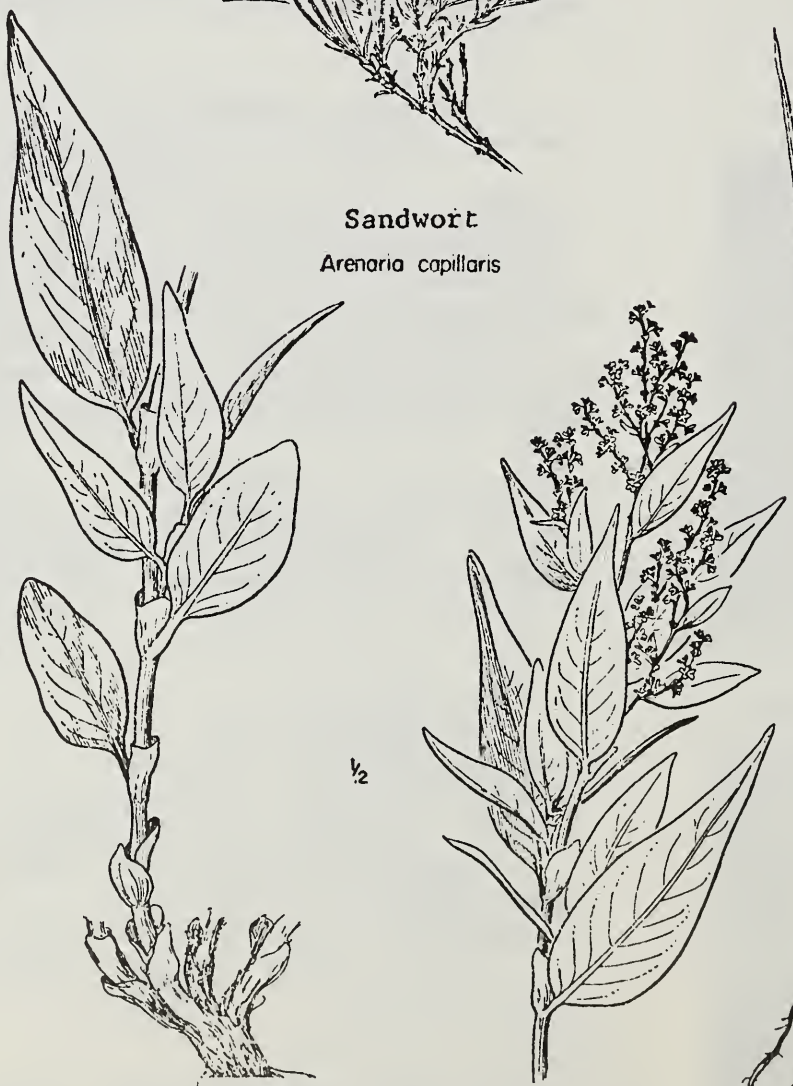
ALPINE FESCUE GS-12-11

Elk sedge

C. geyeri

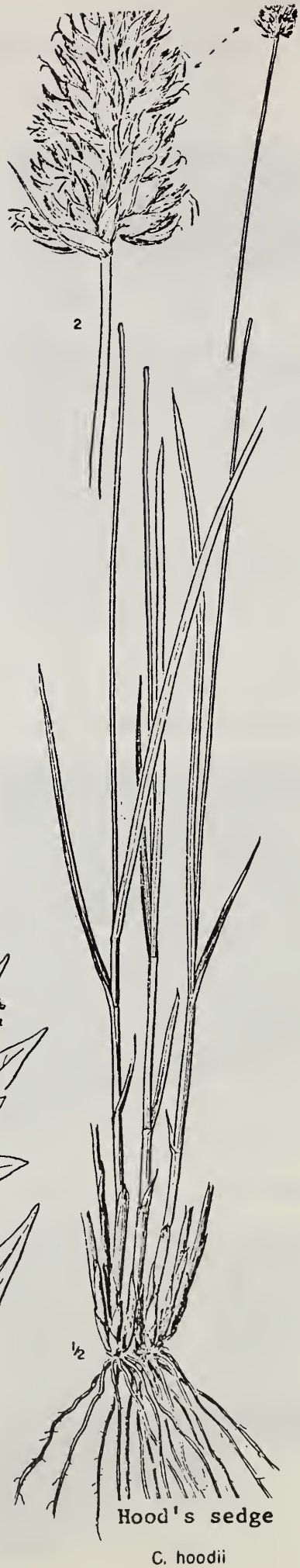
Sandwort

Arenaria capillaris



Pokeweed fleeceflower

P. phytolaccaefolium



Hood's sedge

C. hoodii

ALPINE SEDGE GS-39-11 (Alpine Carex geyeri) (1AC)

Range Condition Guide: **Alpine openings R6-2210-29**

Invading fleeseflower

ENVIRONMENT

Slope position: **upper to top**
Aspect: **southerly (northerly)**
% slope: **5 - 40% (60)**
Elevation: **6800-8200 (6200)**
Topography: **rolling to steep (rough)**

SOILS

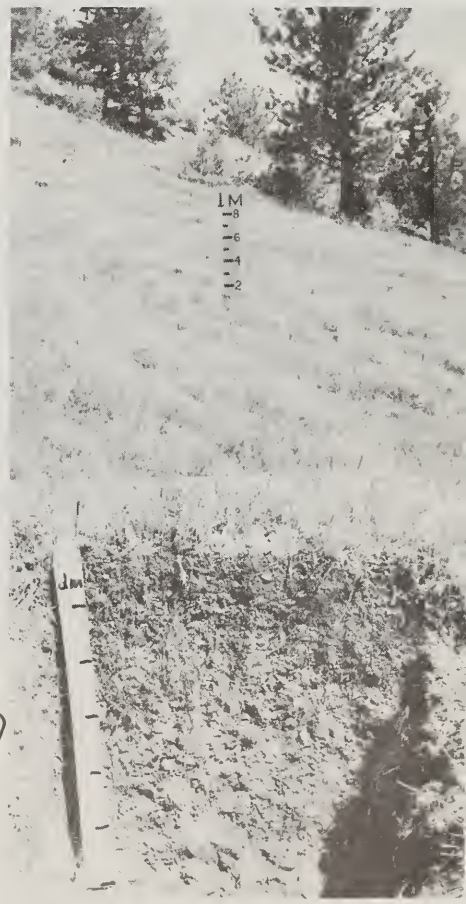
Geology: **granitic, lava**
Total depth: **18-40 inches (10)**
Effective depth: **10-30 (5)**
Stonyness: **30-50%**
Texture: **loams**
Structure: **weak to mod. blocky**
Special: **A horizon subject to loss by erosion**

VEGETATION

Dominants	% Cover	Status
Elk sedge	**40-95**	**Decreaser, will not colonize eroded B horizon**
Hood sedge	**0-20**	**Decreaser to icecream plant**
Yarrow	**3-7**	**Increaser**

Elk sedge and needlegrass

Good condition is characterized by closed sod of elk sedge with some Hood sedge and occasional yarrow.
Poor condition is characterized by two conditions - non-eroded A horizon and eroding A horizon (when the entire A horizon has been eroded away, the site has changed and the area should not be classified as GS-39-11; it probably would fit Alpine fleeceflower FS-59-11). Non-eroded conditions are dominated by needlegrass and squirreltail with little erosion pavement evident. Eroding conditions (see picture) often have pokeweed fleeceflower and sandwort growing on the exposed B horizon which may have a covering of erosion pavement.
Revegetation has been unsuccessful due to cold soils and short growing seasons which are inimical to domestic grass establishment and growth.
Elk sedge is a very palatable sedge which is used extensively by elk, deer, cattle and sheep.
Indicators: high elevation, occasional whitebark pine or subalpine fir, exposed ridges above "timberline."



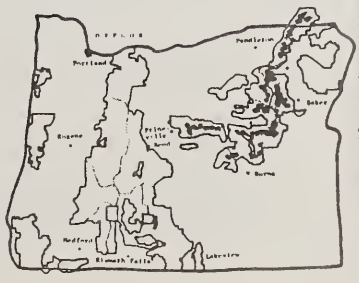
6 dm. = 24 inches

CHARACTERISTICS (6 plots)

	Herbage	Surface Rock	Erosion Pavement	Bare Ground	Moss
Mean	391 lbs	0%	0%	0%	0%
5% level	90 lbs				

RANGE CONDITION

(Decreasers: **elk sedge, Hood sedge**)
Good: **80% cover of XX + plants**
Fair: **40 - 79% or XX - XX plants**
Poor: **2 - 39% or XX - XX plants**
V. Poor: **no decreasers**



ALPINE SEDGE GS-39-11

BISCUIT SCABLAND SD B9 or GB B9
(Biscuit-scab) (4R/4T, 1S/1FD)

Range condition Guide: Shrub and non-shrub scablands R6-2210-46 and either Artemisia-Agropyron-Festuca R6-2210-52 or Agropyron-Festuca R6-2210-23

ENVIRONMENT
Slope position: mid to top
Aspect: all directions
% slope: less than 25%
Elevation:3500-5500
Topography: generall land is undulating to rolling; micro-topography is biscuit of soil with very shallow soil between.

SOILS
Geology: basic, flow lavas
Total depth: 4-10" & 18-36"
Effective depth:3-8 & 10-30
Stonyness: 35% and 15%
Texture: both loam to clay loam
Structure: Moderate, blocky
Special: an unusual geological formation of unknown process; small (5-30ft diam.) islands of soil on scabland.

VEGETATION

Dominants	% Cover	Status
Scab:		
Bluegrass	20-30	Climax dominant, decreaser
Onespike oatgrass	0-20	Decreaser to icecream plant
Bighead clover	0-20	Decreaser
Rigid sage	0-20	Decreaser, deciduous, palatable
Biscuit:		
Big sage	0-15	Climax shrub, central, south
Low sage	0-22	Climax shrub, central, south
Wheatgrass	15-35	Decreaser, southerly slopes
Fescue	5-25	Decreaser, northerly slopes
Sandburg bluegrass	10-20	Increaser, palatable to game
Yarrow	1-6	Increaser, indicates good site

Good condition, wheatgrass is dominant on biscuits, ponderosa and juniper scattered on biscuits.

Pubescent wheatgrass successful on biscuits, failure on scabland.

TYPE Condition is characterized by raised mounds of deep soil scattered about on sage or bunchgrass scabland. Wheatgrass and fescue can grow on the good site biscuits and can produce an abundance of forage. However, total site productivity is limited by the proportion of biscuits to scabland.
Good condition is best evaluated on the biscuits since they tend to deteriorate first. In the southern and central Blues, low or big sage may be common with wheatgrass and/or fescue dominating crown cover (see GB 49-11, GB 49-12, SD 19 11, SD 29 11).
Poor Condition is first expressed by abundant cheatgrass on the biscuits, use the biscuits for condition determination.
Revegetation of the biscuits is possible, of the scabland between not possible (see picture). Dragging a seed drill across the scabland tends to destroy the gravel pavement and thus open the scabs to wind and water erosion. Drill only when enough biscuit is present to warrent cost (50% or more?).

Poor condition biscuits, good scab

Characteristics: See type decriptions under GB 49 11, GB 49 12, SD 19 11, SD 29 11.

Range Condition: Determine condition separately for the biscuit and the scabland. Use condition guides for the appropriate type.

SUMMARY OF PRODUCTIVITY DATA

Plant Community \ Productivity Characteristic	N[2]	Herbage[1] Mean	Herbage E.05[3]	Herbage Range	Surface Rock Mean	Surface Rock E.05	Surface Rock Range	Erosion Pavement Mean	Erosion Pavement E.05	Erosion Pavement Range	Bare Ground Mean	Bare Ground E.05	Bare Ground Range	Moss Mean	Moss E.05	Moss Range
Dry meadow (MD)	0	800	300	500-1100												
Moist Meadow (MM)	0	1400	400	1000-1800												
Wet meadow (MW)	0	2200	600	1600-2800												
Quaking aspen meadow (HQ M1)	0	1400	400	1000-1800												
Bluegrass scabland (GB 91 11)	6	160	38	122-198	23%	13%	10%-36%	7%	12%	0%-19%	31%	14%	17%-45%	22%	16%	6%-38%
Bunchgrass-shallow, gentle slope (GB 49 11)	9	363	140	223-503	18%	9%	9%-27%	5%	3%	2%-8%	11%	6%	5%-17%	15%	10%	5%-25%
Bunchgrass-deep soil gentle slope (GB 49 12)	8	679	250	429-929	7%	9%	0%-16%	1%	2%	0%-3%	11%	6%	5%-17%	7%	4%	3%-11%
Bunchgrass-shallow, steep slope (GB 49 13)	8	300	96	204-396	40%	14%	26%-54%	10%	8%	2%-18%	13%	10%	3%-23%	2%	2%	0%-4%
Buncgrass-deep soil steep slope (GB 49 14)	16	434	54	380-488	21%	7%	14%-28%	5%	3%	2%-8%	19%	9%	10%-28%	4%	3%	1%-7%
Stiff sage scabland (SD 91 11)	24	207	54	153-261	22%	5%	17%-27%	18%	5%	13%-23%	20%	5%	15%-20%	8%	2%	6%-10%
Low sagebrush - bunchgrass (SD 19 11)	22	411	53	358-464	13%	5%	8%-18%	10%	5%	5%-15%	16%	5%	11%-21%	5%	3%	2%-8%
Big sagebrush -bunchgrass (SD 29 11)	15	412	57	354-469	5%	5%	0%-10%	11%	6%	5%-17%	10%	3%	7%-13%	0%		
Juniper - bunchgrass (CJ G1 11)	9	363	140	223-503	18%	9%	9%-27%	5%	3%	2%-8%	11%	6%	5%-17%	15%	10%	5%-25%
Juniper - stiff sage scabland (CJ S8 11)	24	207	54	153-261	22%	5%	17%-27%	18%	5%	13%-23%	20%	5%	15%-25%	8%	2%	6%-10%
Juniper - low sagebrush (CJ S1 11)	22	411	53	358-464	13%	5%	8%-18%	10%	5%	5%-15%	16%	5%	11%-21%	5%	3%	2%-8%
Juniper - big sagebrush (CJ S2 11)	15	412	57	354-469	5%	5%	0%-10%	11%	6%	5%-17%	10%	3%	7%-13%	0%		
Bitterbrush - bunchgrass (SD 39)	5	375	65	310-440	6%	6%	0%-12%	12%	9%	3%-21%	11%	10%	1%-21%	5%	6%	0%-11%
Mountainmahogany - grass (SD 49)	4	366	38	328-404	25%	18%	7%-43%	10%	9%	1%-19%	3%	3%	0%-6%	0%		
Snowberry shrubland (SM 31)	3	320	67	253-387	21%	18%	3%-39%	3%	3%	0%-6%	5%	4%	1%-9%	0%		
Ninebark shrubland (SM 19)	9	195	97	98-292	2%	4%	0%-6%	0%			0%			20%	20%	0%-40%
Thinleaf alder (SM 29)	5	100	100	100±	0%			0%			0%			0%		

1/ Herbage is all above ground herbaceous plant material; it is not forage; no "propoer use" factors have been applied.
2/ N is the number of plots in the sample; may be used to compute standard error and confidence intervals other than 5%.
3/ E.05 is the 95% (or the 5%) confidence interval (19 out of 20 samples lies between ± E.05).

SUMMARY OF PRODUCTIVITY DATA

Plant Community / Productivity Characteristic	N[5]	Herbage[1] Mean	Herbage E.05[6]	Herbage Range	Site Index[2] Spp	Site Index Mean	Site Index E.05	Site Index Range	Total Basal Area Mean	Total Basal Area E.05	Total Basal Area Range	Growth Basal Area[3] Mean	Growth Basal Area E.05	Growth Basal Area Range	Productivity Index[4] (ft^3/A/Yr) Mean	Productivity Index E.05	Productivity Index Range	Stocking in Trees/A @ 6" ave. DBH 10 rpi growth
Ponderosa pine-wheatgrass (CP G1 11)	20	429	87	342-516	PP_{10}	57	5	52-62	33	6	17-39	23	5	18-28	10	3	7-13	63 - 98
Ponderosa pine-fescue (CP G1 12)	20	359	32	327-391	PP_{10}	61	4	57-65	65	12	53-77	44	5	39-49	19	4	15-23	136 - 172
Ponderosa-bitterbrush-Ross sedge (CP S2 21)	6	194	35	159-229	PP_{10}	64	4	60-68	102	29	73-131	55	8	47-63	23	4	19-27	164 - 210
Ponderosa pine-blue wildrye (CP M1 11)	4	1009	489	520-1498	PP_{10}	74	4	70-78	109	29	80-138	55	13	42-68	30	11	19-41	147 - 238
Ponderosa-Douglas fir-elk sedge (CD G1 11)	19	341	33	308-374	PP_{10}	64	3	61-67	111	16	95-127	71	7	64-78	31	3	28-34	214 - 273
					DF_{10}	70	5	65-75										
Ponderosa-Douglas fir-snowberry (CD S6 11)	14	384	48	332-432	PP_{10}	72	9	63-81	147	57	90-204	118	28	90-146	58	15	43-73	315 - 510
					DF_{10}	70	12	58-82										
Ponderosa-Douglas fir-ninebark (CD S7 11)	9	296	36	260-332	PP_{10}	72	4	68-76	108	35	73-143	103	16	87-119	49	5	44-54	305 - 415
					DF_{10}	69	13	56-82										
					WL_5	48	6	42-54										
Mixed conifer-pinegras Residual (CW G1 11)	16	309	68	241-377	PP_{10}	72	3	69-75	129	17	112-146	87	8	79-95	43	6	37-49	275 - 330
					DF_{10}	81	8	73-89										
					WF_5	52	3	49-55										
Mixed conifer-pinegras Ash soil (CW G1 12)	33	330	56	274-386	PP_{10}	75	4	71-79	156	19	137-175	105	8	97-113	53	5	48-58	340 - 395
					DF_{10}	76	3	73-79										
					WF_5	56	3	53-59										
					WL_5	54	8	46-62										
Lodgepole-pinegrass-grouse huckl. (CL G2 11)	9	274	47	227-321	LP_5	40	7	33-47	121	41	80-162	93	22	71-115	45	12	33-57	250 - 405
					WF_5	52	6	46-58										
					WL_5	44	7	37-51										
					DF_{10}	82	8	76-90										
Lodgepole-big huckleberry (CL S5 11)	11	200	89	111-289	LP_5	31	6	25-37	143	23	120-166	82	27	55-109	33	11	22-44	193 - 380
					WF_5	40	3	37-43										
					WL_5	57	9	48-66										

1/ Herbage is all above ground herbaceous plant material; it is not forage; no "proper use" factors have been applied.
2/ Site index values are based on age at 100 (i.e. PP_{10}) or age 50 (i.e. WF_5). PP = ponderosa, DF = Douglas-fir, WF = white fir, WL = western larch, LP = lodgepole pine.
3/ Growth basal area is that basal area at which crop trees grow at 15 rpi.
4/ Productivity index is calculated as: SI/10 X GBA/10 X 0.7; it indexes productivity based upon optimum stand management.
5/ N is the number of plots in the sample; may be used to compute standard error and confidence intervals other than 5%.
6/ E.05 is the 95% (or the 5%) confidence interval (19 out of 20 samples lies between ± E.05).

Productivity Characteristic Plant Community	N	Herbage Mean	Herbage E.05	Herbage Range	Site Index Spp[1/]	Site Index Mean	Site Index E.05	Site Index Range	Total Basal Area Mean	Total Basal Area E.05	Total Basal Area Range	Growth Basal Area Mean	Growth Basal Area E.05	Growth Basal Area Range	Productivity Index (ft^3/A/Yr) Mean	Productivity Index E.05	Productivity Index Range	Stocking in Trees/A @ 6" ave. DBH 10 rpi growth
Lodgepole-grouse huckleberry (CL S4 11)	13	116	40	76-156	LP_5	35	9	26-44	171	51	120-222	78	13	65-91	35	9	26-44	225 - 320
					AF_5	30	6	24-36										
					ES_5	42	6	36-48										
White fir-twinflower-Forb (CW F3 11)	15	208	95	113-303	WF_5	55	4	51-59	202	35	167-237	185	22	163-207	115	22	93-137	570 - 720
					DF_{10}	80	10	70-90										
					WL_5	51	6	45-57										
					ES_5	53	12	41-65										
White fir-big huckleberry(CW S2 11)	17	301	67	234-368	WF_5	54	4	50-58	181	21	160-202	142	17	125-159	79	12	67-91	435 - 555
					DF_{10}	71	7	64-78										
					PP_{10}	73	5	68-78										
					WL_5	50	4	46-54										
					ES_5	58	8	50-66										
					AF_5	32	7	25-39										
					WP_5	46	6	40-52										
White fir-grouse huckleberry(CW S8 11)	6	248	133	115-381	WF_5	42	20	22-62	146	43	103-189	129	48	81-177	59	30	29-89	285 - 620
					DF_{10}	70	22	48-92										
					WL_5	33	10	23-43										
					PP_{10}	64	10	54-74										
Alpine fir - Big Huckleberry(CE S3 11)	7	292	170	122-462	AF_5	28	9	19-37	160	13	147-173	120	18	102-138	55	13	42-68	355 - 480
					ES_5	38	6	32-44										
Alpine fir-grouse huckleberry(CE S4 11)	4	181	131	60-312	AF_5	22	6	16-28	137	87	50-224	85	15	70-100	29	4	25-33	245 - 350
					LP_5	30	5	25-35										
					WL_5	35	5	30-40										
Alpine fir-whitebark pine-sedge(CA G1 11)	10	273	122	151-395	AF_5	(24)	-	-	-	-	5-100	-	-	-	-	-	1-15	
					LP_5	(25)												

	N	Herbage Mean	Herbage E.05	Herbage Range	Surface Rock Mean	Surface Rock E.05	Surface Rock Range	Erosion Pavement Mean	Erosion Pavement E.05	Erosion Pavement Range	Bare Ground Mean	Bare Ground E.05	Bare Ground Range	Moss Mean	Moss E.05	Moss Range
Alpine sagebrush-Sedge (SS 49 11)	13	383	48	335-431	7%	8%	0%-15%	10%	8%	2%-18%	3%	3%	0%-6%	0		
Alpine Fescue (GS 12 11)	4	254	150	104-404	0			0			3%	3%	0%-6%	12%	6%	6%-18%
Alpine sedge (GS 39 11)	6	391	90	301-481	0			0			0			0		

1/ Site index at age 100 (i.e. DF_{10}) or age 50 (i.e. WF_5). LP = lodgepole pine, AF = sub-alpine fir, ES = Englemann spruce, DF = Douglas-fir, WF = white fir, WL = western larch.

MANAGEMENT CHARACTERISTICS

Non-forested Types:

Forested Types:

NON-FORESTED TYPES

GENERAL SECTION

(1) Soil Depth: Total depth is depth in inches to impervious layer, generally bedrock; Effective depth is total depth less percent soil stone (rooting area).
(2) Soil: % Stone is the percent of the soil occupied by gravel and stone larger than 3/4 inch diameter; Texture is for the topsoil as follows: s = sand, si = silt, l = loam, c = clay, gr = gravelly, st = stony: sil = silt loam, scl = sandy clay loam, grls = gravelly loamy sand, etc.
(3) Climate: Growth season is the growing season - short = less than 90 days, medium = 90-120 days, long = more than 120 days; Frost Heaving means high probability of frost occuring and heaving mineral soil during the growing season.

Plant Community	Elev.	Slope Posit.	Aspect	% Slope	Topography	Geology	(1) Soil Depth: Total / Effective	(2) Soil: % Stone / Texture	(3) Climate: Growth Season / Frost Heaving	Successional Status
Dry Meadow (MD)	2500-6500	bottom	any	less 10%	Undulating to steep	Alluvial	20-60 in. 20-60 in.	0-25% 1 to cl	short to long Frost heaving upper elev.	Some dry meadows former pine-blue wildrye type.
Moist meadow (MM)	2500-6500	bottom	any	less 10%	Undulating to steep	Alluvial, sedimentary	20-60 in 20-60 in.	0-25% 1 to cl	short to long Frost heaving upper elev.	Climax
Wet Meadow (MW)	2500-6500	bottom	any	less 10%	Undulating to steep	Alluvial, sedimentary	20-60 in. 20-30 in.	0-20% Peat, 1-cl	Short to long	Climax
Quaking aspen meadow (HQ M1)	1500-6500	bottom	any	less 10%	Undulating to steep	Alluvial, sedimentary	24-64 in. 24-64 in.	0-40% sl to cl	Short to long Frost heaving upper elev.	Climax, aspen clonal in nature.
Bluegrass Scabland (GB 91 11)	4600-6200	Top to mid	south	less 20%	Undulating to rolling	flow lava, recent	4-8 in. 3-6 in.	20-40% sl to l	Mid to short Severe frost heaving	Climax small bunchgrasses due to very shallow soil (lithosol); edaphic climax in the forest zone.
Bunchgrass - shallow soil, gentle slopes (GB 49 11)	3500-5500	Top to low	any	less 25%	Undulating to rolling	basic lavas, flow lavas	8-14 in. 6-10 in.	35% 1 to sil	Long to medium Moderate frost heaving(winter)	Climax bunchgrass, restricted in production and density by shallow soil; edaphic climax in the forest zone.
Bunchgrass - deep soil, gentle slopes (GB 49 12)	3500-5000	top to mid	any	less 25%	Undulating to rolling	Wind deposite, Flow lavas	15-45 in. 7-30 in.	12-40 in sl, l, stl	Long to medium	Climax grassland, "Palouse Prairie" on deeper, wind deposited soil; edaphic climax in the forest zone.
Bunchgrass - Shallow soil, Steep slopes (GB 49 13)	3500-6000	Upper to lower	South	30-100%	Steep to rough	Acid and basic lavas, tuffs, coluvium	8-14 in. 4-8 in.	30-60% stls - stl	Long to short Moderate frost heaving (winter)	Climax grassland, production limited by shallow soil; topo-edaphic climax in forest zone.
Bunchgrass - deep soil, steep slopes (GB 49 11)	3000-6200	Upper to lower	South	30-100%	Steep to rough	Basic and acid lava, wind deposited, colluvium	20-30 in. 10-20 in.	25-50% stls - st st sil	Long to medium Slight frost heaving(winter)	Climax grassland, topographic climax in the forest zone.
Stiff sage scabland (SD 91 11)	3500-6000	Top to low	South	less 20%	Undulating to rolling	Recent basic & acid lava flows	4-10 in. 3-7 in.	25-60% stl - stcl	Long to medium Severe frost heaving	Climax sagebrush; edaphic climax in the forest zone due to very shallow soil (lithosol).
Low sagebrush - bunchgrass (SD 19 11)	4000-5800	Mid to top	any	less 15%	Undulating to rolling	Basic and acid lavas	10-25 in. 4-20 in.	15-50% sl - stcl	Mid to long Moderate frost heaving	Climax sagebrush, edaphic climax in the forest zone; restricted drainage.
Big sagebrush - bunchgrass (SD 29 11)	3500-5800	low to top	any	5-40%	Undulating to rolling	Lavas, sedimentary, granitics	24-48 in. 18-30 in.	15-55% sl to cl	Long to medium Little frost heaving	Climax sagebrush, tends to be climatic climax, grades into pine-sagebrush savanna; pine type with sagebrush edaphic climax.
Juniper - bunchgrass (CJ G1 11)	3500-5500	Top to low	any	less 25%	Undulating to rolling	Basic flow lavas	8-14 in. 6-10 in.	35% 1 to sil	Long to medium Some frost heaving	Climax juniper at the northern limit of its range, topo-edaphic climax in the forest zone.
Juniper - stiff sage scabland (CJ S8 11)	3500-5500	Top to low	South	less 25%	Undulating to rolling	basic and acid flow lavas	4-10 in. 3-7 in.	25-60% stl - stcl	Long to medium Severe frost heaving	Climax juniper - sage, edaphic climax in the forest zone due to very shallow soil (lihtosols).
Juniper - low sagebrush (CJ S1 11)	4000-5800	Mid to top	any	less 15%	Undulating to rolling	Basic & acid flow lavas	10-25 in. 4-20 in.	15-50% sl - stcl	Long to medium Moderate frost heaving	Climax juniper - sagebrush, edaphic climax in the forest zone due to shallow soils.
Juniper - big sagebrush (CJ S2 11)	3500-5800	Low to top	any	5-30%	Undulating to steep	Lavas, sedimentary, granitics	24-48 in. 18-30 in.	15-55% sl - stcl	Long to medium Little frost heaving	Climax juniper - sagebrush, tends to be climatic climax, grades in to pine - juniper savanna.
Bitterbrush - bunchgrass (SD 39)	3500-5000	low to top	South	5-30%	Rolling to steep	Lavas, sedimentary, granitics	24-48 in. 15-30 in.	15-60% sl - stl	Long to medium Little frost heaving	Climax shrubland, often an edaphic climax community - moist "high desert" or dry forest zone.
Cutleaf mountainmahogany grass (SD 49)	3500-6000	Mid to top	South	10-60%	Rolling to rough	Basic and acid lavas	10-25 in. 5-20 in.	40-70% stsl - stl	Long to short Moderate frost	Edaphic (shallow, stony soil) climax in the forest zone, on tuffs grades to pine savanna.

(1) Soil Depth: Total depth is depth in inches to impervious layer, generally bedrock; Effective depth is total depth less percent soil stone (rooting area).
(2) Soil: % Stone is the percent of the soil occupied by gravel and stone larger than 3/4 inch diameter; Texture is for the topsoil as follows: s = sand). si = silt, l = loam, c = clay, gr = gravelly, st = stony: sil = silt loam, scl - sandy clay loam, grls = gravelly loamy sand, etc.
(3) Climate: Growth season is the growing season - short = less then 90 days, medium = 90-120 days, long = more then 120 days; Frost Heaving means high probability of frost occuring and heaving mineral soil during the growing season.

Plant Community	Elev.	Slope Posit.	Aspect	% Slope	Topography	Geology	(1) Soil Depth: Total / Effective	(2) Soil: % Stone / Texture	(3) Climate: Growth Season / Frost Heaving	Successional Status
Snowberry shrubland (SM 31)	1700-5800	Low to upper	South	30-80%	Rolling to rough	Lavas, tuffs, colluvium	24-48 in. / 12-36 in.	5-40% / l - stsil	Long to medium / Little frost hesving	May be a result of repeated ground fires which have eliminated pine & fir, many stands seem nesr climax - status questionable
Ninebark shrubland (SM 19)	1700-5800	Low to top	North	60-120%	Steep to rough	Basic lavas, tuffs, loess, colluvium	24-48 in. / 12-36 in.	30-60% / stl - stsil	Long to medium / Little frost heaving	Questionable climax status, seem to be fire caused by elimination of fir and pine; ninebark very fire resistant - sprouts.
Thinleaf alder snowslides (SM 29)	2000-6000	Top to bottom	North	40-120%	Steep to rough	Lsvas, tuffs, granitics, colluvium	24-48 in. / 18-40 in.	0-35% / l to sil	Long to short / Moderate frost heaving high	Topographic climax due to snow sliding down steep slopes and periodically killing trees.
Sub-alpine fir - whitebark pine - sedge (CA Gl 11)	6800-8000	Mid to top	any	5-60%	Rolling to steep	Lsvas, tuffs, grsnitics, serpentine, ash, colluvium	24-48 in. / 12-36 in.	30-60% / stsl - stl	Short season / Severe frost heaving	Sub-alpine climax forest park-lsnd; groups of trees in nstural openings; krumholtz trees (dwarf form due to climat).
Alpine fleeceflower (FS 59 11)	6000-8200	Upper - top	South	5-40%	Rolling to rough	Granitic, lavss.	20-40 in. / 10-30 in.	30-60% / sl - stl	Sort season / Severe frost hesving	Indicates eroded site, topsoil gone - natural climax potential gone (alpine fescue or slpine sedge) - now edaphic"climax".
Alpine sagebrush - sedge (SS 41 11)	6100-8200	Mid to top	South	5-30%	Rolling to rough	Granitic, lavas, colluvium.	20-36 in. / 7-23 in.	25-60% / sl - stl	Short season / Severe frost heaving	Climax "alpine" community, sage is sub-alpine vsriety (vaseysna) with different chromozones, elk sedge is alpine form.
Alpine fescue GS 12 11)	6500-8200	Mid to top	North	5-45%	Rolling to rough	Lavas (no granitics)	14-38 in. / 8-20 in.	25-60% / sl - stsil	Short sesson / Severe frost heaving	Climax horth slope "alpine" type on lsva type soils; green fescue is very limited in Blue Mtns - alpine form of Idsho fescue dom.
Alpine sedge (GS 39 11)	6800-8200	Upper - top	South & north on granitic	5-40%	Rolling to rough	Grsnitic, lavss	18-40 in. / 10-30 in.	30-50% / sl - stsil	Short season / Severe frost heaving	South slope snd granitic "alpine" climsx grass-type; alpine form of elk sedge, ssme ground vegetas opens in whitebark pine type.

RANGE AND WILDLIFE SECTION

(1) Rate of Range Trend: Time to double density of herbaceous plants with non-use (time increases with increasing use) -slow = 10 years or more, moderate = 5-10 years, fast = less than 5 years to double herbaceous density; factors limiting rate of change may be listed.
(2) Revegetation Potential: characteristics of the site make it more or less suitable for revegetation; optimum technique in seeding is assumed - NO = no potential for revegetation, low = maximum crown cover of seeded species less than 30%, fair = 30-60% crown cover potential, good = crown cover greater 60%; Spp. Groups = those species listed by group in Species List C following this section.
(3) Forage Production: forage production is 50% of the total, palatable herbage produced under good range condition (and under managed timber stand crown cover conditions) for livestock, wildlife, and for revegetation when a good seeding job is done - low = 50-150 lbs per acre, Moderate = 150-300, High = 300-500, v. high = more than 500 lbs per acre.

Plant Community	Native Understory Response to Timber Management	Decreasers and Key Plants	(1) Rate of Range Trend	(2) Revegetation Potential Spp. Groups	(3) Forage Prod.: Livestock Wildlife Revegetation	Special
Dry meadow (MD)		Tufted hairgrass Kentucky bluegr Calif. oatgrass	Moderate to fast	Good potential Moist site grasses	Stock - high Wldlf - high Reveg.- high	Of dry, moist & wet meadows, dry are the most sensitive to use; stock must be controled after revegetation
Moist meadow (MM)		Tufted hairgr Ovalhead sedge Calif. oatgrass Bentgrass	Fast	Good potential Meadow site grasses	Stock - v. high Wldlf - v. high Reveg.- v. high	Early spring moist to wet soils may limit early grazing due to compaction.
Wet meadow (MW)		Nebraska sedge Ovalhead sedge Bentgrass	Fast	Good by hard Moist site grasses	Stock - v. high Wldlf - high Reveg.- v. high	Wet to moist soil often limits acceptable use by cattle due to soil compaction.
Quaking aspen meadow (HQ M1)	Grasses recover in 2-4 years following disturbance and non-livestock use.	Quaking aspen Tufted hairgrass Ovalhead sedge Bentgrass	Fast for grasses Moderate to slow for aspen	Good potential moist site grass	Stock - v. high Wldlf - v. high Reveg.- v. high	Aspen highly palatable to game, stock, fur bearers; root sprouts from clonal root system.
Bluegrass scabland (GB 91 11)		Sandberg bluegr Onespike oatgr. Bighead clover Balsamroot	Slow - shallow soil, extreme soil moisture fluctuations	NO potential No suitable spp	Stock - low Wldlf - low Reveg - NONE	Winter soil moisture saturation, summer soil drying to wilting precludes revegetation, many spp., early grazing limited.
Bunchgrass - shallow soil, gentle slopes (GB 49 11)		Wheatgrass Fescue	Slow to moderate due shallow soil	Low potential Shallow soil Dry site grass	Stock - moder Wldlf - low Reveg.- moder	Shallow soil limits revegetation success: dark brown soil best production and reveg, lighter reddish soil lowest.
Bunchgrass - deep soil, gentle slopes (GB 49 12)		Wheatgrass Fescue Prairie junegr.	Moderate Increase by seed	Good potential Dry site group	Stock - high Wldlf - low Reveg.- high	Flat slopes with restricted drainage may habe prairie junegrass dominant.
Bunchgrass - shallow soil, steep slopes (GB 49 13)		Wheatgrass Fescue Sandberg bluegr	Slow - shallow soil, steep south slopes	NO potential by mechanical means due steep slopes	Stock - low Wldlf - low Reveg.- NONE	Often used as big game winter range due to southerly slopes which tend to remain snow free.
Bunchgrass - deep soil, steep slopes (GB 49 14)		Wheatgrass Fescue	Slow to moderate Due to steep south slopes	NO potential by mechanical means due steep slope	Stock - moder Wldlf - low Reveg.- NONE	Often used as game winter range due to southerly slopes which tend to remain snow free.
Stiff sage sacbland (SD 91 11)		Stiff sage Sandberg bluegr Bighead clover (Wheatgrass)	Slow - shallow soil, extreme soil moisture fluctuations	NO potential no suitable spp	Stock - low Wldlf - low Reveg.- NONE	Sage is palatable and desirable, part of climax; extreme soil moisture fluctuations - saturated to wilting, early grazing limited.
Low sagebrush - bunchgras (SD 19 11)		Wheatgrass Fescue	Slow - due to shallow soil, competition from sage	Low potential -Can spray sage Dry site group	Stock - moder Wldlf - moder Reveg.- moder	Sage is part of climax, moderately palatable to game; soil shallow, often saturated in winter and spring - limits early grazing
Big sagebrush - bunchgras (SD 29 11)		Wheatgrass Fescue Prairie junegrs	Slow to moderate Competition from sage limits rate	Good potential slopes less 25%, spray Dry site group	Stock - Moder Wldlf - Moder Reveg.- high	Sagebrush is part of climax, will "re-invade" following spraying or drilling grasses; sage often important winter game forage.
Juniper - bunchgrass (CJ G1 11)		Wheatgrass Fescue	Slow - shallow soil limits	Low potential Juniper control incre. forage	Stock - moder Wldlf - low Reveg.- moder	Juniper used as emergency game winter forage.
Juniper - stiff sage scabland (CJ S8 11)		Stiff sagebrush Sandberg bluegr Bighead clover	Slow - shallow soil, soil moist. fluctuations	NO potential NO suitable spp	Stock - low WLdlf - low Reveg.- NONE	Sage is palatable and desirable, part of climax, juniper emergency winter game forage.
Juniper-low sagebrush (CJ S1 11)		Wheatgrass Fescue	Slow due to shallow soil, sage competition	Low potential Can spray sage Dry site group	Stock - moder Wldlf - low Reveg.- moder	Sage is part of climax, moderately palatable to game, juniper emergency winter game forage.
Juniper - big sagebrush (CJ S2 11)		Wheatgrass Fescue	Moderate to slow Competition from sage limits rate	Good potential slope less 25 Dry site group	Stock - Moder Wldlf - Moder Reveg.- Moder	Sage is part of climax, will "re-invade after drilling or seeding, sage & juniper winter game food.
Bitterbrush - bunchgrass (SD 39)		Bitterbrush Wheatgrass Fescue	Moderate to slow Increase by seed	Good potential Spray sage? Dry site group	Stock - Moder Wldlf - high Reveg.- Moder	Can spray for sage control and not severely damage bitterbrush, Bitterbrush highly patable.
Curlleaf mountainmahogany Grass (SD 49)		Mahogany Wheatgrass Elk sedge	Moderate to slow Due to stony soil	Fair potential Dry site group	Stock - moder Wldlf - Moder Reveg.- mod.	Mahogany highly palatable, hard to regenerate, soils very stony

(1) Rate of R nge Trend: Time to double density of herbaceous plants with non-use (time increases with increasing use) - slow = 10 years or more, moderate = 5-10 years, fast = less than 5 years to double herbaceous density; factors limiting rate of change may be listed.
(2) Revegetation Potential: characteristics of the site make it more or less suitable for revegetation; optimum technique in seeding is assumed - NO = no potential for revegetation, low = maximum crown cover of seeded species less than 30%, fair = 30-60% crown cover potential, good = crown cover greater 60%; Spp. Groups = those species listed by group in Species List C following this section.
(3) Forage Production: forage production is 50% of the total, palatable herbage produced under good range condition (and under managed timber stand crown cover conditions) for livestock, wildlife, and for revegetation when a good seeding job is done - low = 50-150 lbs per acre, Moderate = 150-300, High = 300-500, v. high = more than 500 lbs per acre.

Plant Community	Native Understory Response to Timber Management	Decreasers and Key Plants	(1) Rate of Range Trend	(2) Revegetation Potential Spp. Groups	(3) Forage Prod.: Livestock Wildlife Revegetation	Special
Snowberry shrubland (SM 31)		Wheatgrass Fescue Elk sedge	Slow - due to competition from snowberry	Good - but must control shrub Moist site spp.	Stock - Moder. Wldlf - Moder. Reveg.- High	Snowberry often rhyzomatous, may be difficult to control for reveg. Snowberry moderately palatable, generally increase in down trend.
Ninebark Shrubland (SM 19)		Elk sedge	Slow - severe shrub competition	Good on slopes less 25%, must reduce shrubs. Moist Site spp.	Stock - low Wldlf - low Reveg.- high	May be fire induced shrubland - potential for fir? Ninebark sprouts following fire or other disturbance.
Thinleaf alder snowslide (SM 29)		Thinleaf alder bent downhill	(moderate after snow slide - not a grazing type)	NO potential due snow slides	Stock - low Wldlf - low Reveg.- NONE	Forest potential but trees killed by cascading snow; some small, seeps dominated by alder.
Sub-alpine fir - whitebark pine - Sedge (CA G1 11)	Not commercial forest - Should not be logged.	Elk sedge Hood's sedge	Slow - severe climate (alpine)	Low - due to alpine condition High Elevation Site spp.	Stock - Moder. Wldlf - Moder. Reveg.- low	Open parkland of fir and pine - severe climate limits mgt., erosion is often present - heals slowly.
Alpine Fleeceflower (FS 59 11)		Lupine Elk sedge Hood sedge	Slow - eroded site, must build topsoil.	NO potential due eroded site	Stock - low Wldlf - low Reveg.- NONE	Eroded conditions of former alpine sedge, alpine fescue or alpine sagebrush - topsoil eroded away.
Alpine sagebrush - sedge (SS 49 11)		Elk sedge Hood sedge	Slow - severe climate (alpine)	Low - due to alpine condition High Elevation Site spp.	Stock - Moder. Wldlf - low Reveg.- low	Highly palatable type, most sites suffering from erosion; elk sedge requires topsoil for maintainance in the stand.
Alpine Fescue (GS 12 11)		Fescue Green fescue Ross sedge	Slow - due to climate and seed reprod. (Alpine)	Low - due to alpine climate High elevation Site spp.	Stock - low Wldlf - low Reveg.- low	High elevation strain of Idaho fescue (occasional stands of fair condition green fescue included). Fescue requires topsoil.
Alpine sedge (GS 39 11)		Elk sedge Hood sedge	Slow - due to sever climate	Low - due to alpine condition High elevation site spp.	Stock - moder. Wldlf - low Reveg.- low	Highly palatable type, most sites partly eroded; elk sedge requires topsoil for maintainance in the stand.

FORESTED TYPES

GENERAL SECTION

(1) Soil Depth: Total depth is depth in inches to impervious layer, generally bedrock; Effective depth is total depth less percent soil stone (rooting area).
(2) Soil: % Stone is the percent of the soil occupied by gravel and stone larger then 3/4 inch diameter; Texture is for the topsoil as follows: s = sand, si = silt, l = loam, c = clay, gr = gravelly, st = stony: sil = silt loam, scl = sandy clay loam, grls = gravelly loamy sand, etc.
(3) Climate: Growth season is the growing season - short = less than 90 days, medium = 90-120 days, long = more than 120 days; Frost Heaving means high probability of frost occuring and heaving mineral soil during the growing season.

Plant Community	Elev.	Slope Posit.	Aspect	% Slope	Topography	Geology	(1) Soil Depth: Total / Effective	(2) Soil: % Stone / Texture	(3) Climate: Growth Season / Frost Heaving	Successional Status
Ponderosa pine - wheatgrass (CP G1 11)	2500-5000	all	South	1-100%	Undulating to rough	Any parent material	15-36 in. / 7-24 in.	20-60% / ls - stl	Long to medium / Little frost heaving	Climax pine - savanna condition at lower soil moisture limit of pine; edaphic climax at higher elev.
Ponderosa pine - fescue (CP G1 12)	2500-5500	low to top	any	2-30%	Undulating to rough	Pumice ash, residual from any material	18-36 in. / 10-30 in.	10-50% / sl - stsil	Long to medium / Little frost heaving	Climax pine - moist savanna, grasses and shrubs all grow below the forest zone.
Ponderosa pine - bitterbrush - Ross sedge (CP S2 21)	4500-5500	Mid to top	South	1-15%	Dissected to rolling	Rhyolite and tuff - only	12-24 in. / 6-15 in.	15-50% / grsl - stls	Medium / Little frost heaving	Climax pine, endemic type found on rhyolite and tuff only - large bunchgrasses absent.
Ponderosa pine - blue wildrye (CP M1 11)	2500-5000	Bottom to low	South	2-20%	Undulating to steep	Alluvium, sedimentary	24-38 in. / 20-36 in.	10-30% / l to cl	Long to medium / Little frost heaving	Climax pine dry meadow; most have been clearcut and now appear as stumps in dry to moist meadows.
Ponderosa pine - Douglas-fir - elk sedge (CD G1 11)	4000-6200	Low to top	any	5-45%	Undulating to rough	Lavas, tuffs, granitics, sedimentaries	16-30 in. / 10-20 in.	20-60% / s - stl	Medium to long / Little frost heaving	Climax in pine and fir, often edaphic climax due to shallow soil, soil limits D.fir density.
Ponderosa pine - Douglas-fir - snowberry - oceanspray (CD S6 11)	1700-4800	Bottom to mid	North	3-35%	Rolling to steep	Basic lava, ash, loess, colluvium	30-60 in. / 20-60 in.	0-60% / l - stsil	Long to medium / Little frost heaving	Climax pine and fir type on good soil and northerly slopes - near "climatic" climax at lower elev.
Ponderosa pine - Douglas-fir - ninebark (CD S7 11)	2500-5500	Top to bottom	North	3-60%	Undulating to rough	Lavas, tuffs, ash, colluvium	30-60 in. / 30-60 in.	0-45% / fsl - l	Long to medium / Little frost heaving	Climax fir and pine on good soil and north slopes, higher elev. & ninebark dominance of snowberry.
Mixed conifer - pinegrass Residual soil (CW G1 11)	4000-6500	Top to bottom	Any	5-60%	Undulating to steep	Lavas, granitic tuff, sedimentary, alluvial colluvial	24-48 in. / 10-34 in.	20-60% / ls - stl	Medium / Some frost heaving	Climax fir; ponderosa dominance due to periodic ground fire, DF major climax lower elev., WF at upper elev.
Mixed conifer - pinegrass Ash soil (CW G1 12)	4000-6500	Top to bottom	Any	2-60%	Undulating to rough	Volcanic ash over soil of any parent material	24-48 in. / 20-48 in.	0-35% / fine ls over l-cl	Medium / Some frost heaving	Climax fir; ponderosa dominance due to periodic ground fire, DF major climax lower elev. WF upper elev.,
Lodgepole - pinegrass - grouse huckleberry (CL G2 11)	4000-6000	Bottom to top	north	2-20%	Undulating to steep	Volcanic ash over soil of any parent material	30-60 in. / 20-60 in.	2-25% / fine ls over l-cl	Medium / Some frost heaving	Successional to white fir - grouse huckleberry and white fir - twinflower - forb; lodgepole result of confligration fire.
Lodgepole - big huckleberry (CL S5 11)	4500-6500	Low to top	North	2-20%	Undulating to steep	Volcanic ash over soil of any parent material	36-48 in. / 30-48 in.	0-40% / fine ls over l-cl	Medium / Moderate frost heaving	Successional to white fir or subalpine fir - big huckleberry; lodgepole result of confligration fire.
Lodgepole - grouse huckleberry (CL S4 11)	5500-7500	Low to top	North	2-20%	Undulating to steep	Volcanic ash over soil of any parent material	36-60 in. / 20-60 in.	20-40% / fine ls over l-cl	Short to med. / Severe frost heaving	Successional to sub-alpine fir - grouse huckleberry; lodgepole result of confligration fire.
White fir - twinflower - forb (CW F3 11)	2400-6500	Bottom to mid	North	5-40%	Rolling to steep	Volcanic ash over soil of any parent material	40-60 in. / 20-60 in.	10-60% / fine ls over l-cl	Long to medium / Little frost heaving	Climax fir, near climatic climax for mid elevation and 25-35 in. ppt; larch and lodgepole follow confligration fire;
White fir - big huckleberry (CW S2 11)	3500-6500	Bottom to upper	Any	5-110%	Rolling to rough	Volcanic ash over soil of any parent material	36-60" in. / 24-60 in	15-50% / fine ls over l-cl	Medium / Some frost heaving	Climax fir, near climatic climax for mid to upper elevation and 25-35 in. ppt; larch and lodgepole follow confligration fire.
White fir - grouse huckleberry (CW S8 11)	4500-6500	Low to top	North	5-80%	Rolling to rough	Volcanic ash over soil of any parent material	30-50 in. / 24-48 in.	20-50% / fine ls over l-cl	Short to medium / Moderate frost heaving	Climax white fir, coldest white fir sites, gradation into subalpine fir type; larch and lodgepole follow confligration fire.
Sub-alpine fir - big huckleberry (CE S3 11)	4500-6500	Top to mid	North	5-60%	Rolling to rough	Volcanic ash over soil of any parent material	36-48 in. / 24-48 in.	0-40% / fine ls over l-cl	Short to medium / Moderate frost heaving	Climax sub-alpine fir and Engelmann srpuce site; warmest and lowest sub-alpine fir sites; WL & LP follow confligration fire
Sub-alpine fir - grouse huckleberry (CE S4 11)	6000-7500	Mid to top	North	5-50%	Rolling to rough	Volcanic ash over soil of any parent material	36-48 in. / 24-48 in.	20-40% / fine ls over l-cl	Short / Severe frost heaving	Upper elevation climax sub-alpine fir & engelmann spruce forest, LP and WL follow confligration fire.

1-74

FORESTED TYPES

RANGE AND WILDLIFE SECTION

(1) Rate of Range Trend: Time to double density of herbaceous plants with non-use (time increases with increasing use) -slow = 10 years or more, moderate = 5-10 years, fast = less than 5 years to double herbaceous density; factors limiting rate of change may be listed.
(2) Revegetation Potential: characteristics of the site make it more or less suitable for revegetation; optimum technique in seeding is assumed - NO = no potential for revegetation, low = maximum crown cover of seeded species less than 30%, fair = 30-60% crown cover potential, good = crown cover greater 60%; Spp. Groups = those species listed by group in Species List C following this section.
(3) Forage Production: forage production is 50% of the total, palatable herbage produced under good range condition (and under managed timber stand crown cover conditions) for livestock, wildlife, and for revegetation when a good seeding job is done - low = 50-150 lbs per acre, Moderate = 150-300, High = 300 - 500, v. high = more than 500 lbs per acre.

Plant Community	Native Understory Response to Timber Management	Decreasers and Key Plants	(1) Rate of Range Trend	(2) Revegetation Potential Spp. Groups	(3) Forage Prod.: Livestock Wildlife Revegetation	Special
Ponderosa pine - wheatgrass (CP G1 11)	Shrubs non-sprouters: damaged by harvest; bunchgrasses replaced by cheatgrass on 10-20% of the area.	Wheatgrass Fescue Bitterbrush (when present)	Slow - grass due to seed reprod. Shrubs hinder	Fair to good Spray sage Dry site group	Stock - moder. Wldlf - low Reveg.- moder.	Bitterbrush often key game winter forage, type at lower elevs often key game range, stock spring range
Ponderosa pine - fescue (CP G1 12)	Shrubs non-sprouters: damaged by harvest; bunchgrass replaced by cheatgrass on 10-25% area.	Fescue Wheatgrass Bitterbrush	Slow - grass repr. by seed, trees regen. P range.	Good to fair Dry site group	Stock - Moder. Wldlf - low Reveg.- moder.	Bitterbrush and mahogany, when present, tend to be key game food in winter; fescue low in palat.
Ponderosa pine - bitterbrush - Ross sedge (CP S2 21)	Bitterbrush often killed on 15-25% of logged area; squirreltail increases after logging.	Bitterbrush Needlegrass Ross sedge	Slow to moder. - grass reprod. by seed, shrub slow	Low - poor soil Dry site group, Low fertility	Stock - low Wldlf - low Reveg.- low	Poor soil sites - large bunchgrass not adapted (weatgrass,fescue,elk sedge); low palatability type.
Ponderosa pine blue wildrye (CP M1 11)	Rapid recovery on partial disturbed areas even under grazing by Ky. bluegrass.	Blue wildrye (Kentuky bluegr)	Rapid - grasses by rhizomes, good soil.	Good Moist site group	Stock - high+ Wldlf - Moder. Reveg - high +	Forested dry to moist meadow, may be first to deteriorate under heavy use, key area for recovery.
Ponderosa pine - Douglas-fir - elk sedge (CD G1 11)	Sedges reduced on 15-25% of the area - replaced by cheatgrass; shrubs killed on 10-20% area.	Elk sedge bitterbrush (pinegrass)	Moder. - sedge by rhizomes, need topsoil to expand	Fair to good Moist, bottom of dry site groups	Stock - moder.- Wldlf - low Reveg.-moder.	Elk sedge most palatable native forage producer in forested types, equal palat. with non-forest fall.
Ponderosa pine - Douglas-fir - snowberry - oceanspray (CD S6 11)	Shrubs sprout, increase 5-10 years after logging, sedge reduced on 15-30% of area.	Elk sedge Pinegrass	Slow for sedge due increase in shrubs and competition	Fair due to shrub compet. Moist site group	Stock - Moder. Wldlf - moder. Reveg.- moder.	Shrubs sprout following burning or logging & limit grass production and availability; palatable type.
Ponderosa pine - Douglas-fir - ninebark (CD S7 11)	Shrubs sprout, increase 5-10 years after logging, grass and sedge reduced on 15-30% of area	Pinegrass Elk sedge	Slow for grass & sedge due shrub competition	Fair due to shrub compet. Moist site grp.	Stock - moder. Wldlf - low Reveg.- moder.	Shrubs sprout vigorously after burning or logging, limit grass product. and availability.
Mixed conifer - pinegrass Residual soil (CW G1 11)	Grass & sedge reduced on 10-25% of area; forage production reduced as fir crown cover increases (50# per 10% incr.)	Pinegrass Elk sedge	Moderate under less 60% tree cover, light use.	Good, out-prod. native range Moist site grp.	Stock - moder. Wldlf - low Reveg.- high	Lack of shrubs limits game use; herbaceous plants very resistant to ground fire; moderstely palat. type.
Mixed conifer - pinegrass Ash soil (CW G1 12)	Grass and sedge reduced on 10-25% of area - recovery slow on skid trails due easy gouging in ash soil (reduce. 50#/10%cover)	Pinegrass Elk sedge	Moderate under less 60% tree cover, light use.	Good, out-prod. native range Moist site grp.	Stock - moder. Wldlf - low Reveg.- high	Lack of shrubs limits game use; herbaceous plant very resistant to ground fire; moderately palatable type.
Lodgepole - pinegrass - grouse huckleberry (CL G2 11)	Grass and shrubs seldom hurt due to light equipment and logs in lodgepole harvest.	Pinegrass Elk sedge N.W. Sedge	Moder. to slow due colder soils, some weed compet.	Good Moist site grp.	Stock - moder. Wldlf - low Reveg.- moder.+	Poor condition range resembles high elev. lodgepole - grouse huckleberry, but this type has a great variety of forb species.
Lodgepole - big huckleberry (CL S5 11)	Shrubs and herbaceous plants seldon damaged due to small diam. logs and light equipment.	Pinegrass N.W. Sedge	Not range type Moder. increase in herba	Good, out-prod. native Moist site grp.	Stock - low Wldlf - low Reveg.- high	Native forage very limited, seldom contributes to stock forage; reveg can greatly increase forage for both stock and wldlf.
Lodgepole - grouse huckleberry (CL S4 11)	Scant ground vegetation seldom damaged due to light equipment and logs in lodgepole harvest; removal of litter detrimental.	None - no spp. of significance Grouse huckleb. indic. cold soil	Not range type - sparce herbaceous veget. increases slow due cold sls.	Fair - cold soil High elev. Site group	Stock - low Wldlf - low Reveg.- Moder.-	Lack of herbaceous vegetation density and poor variety in species indicates cold soils, very limited environment for animal use.
White fir - twinflower - forb (CW F3 11)	Vegetation generally increases quickly due opening of tree canopy - grasses, forbs, some shrubs.	Pinegrass Columbia brome Mtn. sweetroot	Not range type - fast change in native spp. with tree canopy change	Good, far out-produces native Moist Site Grp.	Stock - low Wldlf - low Reveg.- moder.	No stock value in native vegetation; with optimum TM(70% to 50% tree canopy) seeded forage in skid trails can produce 150-300 usable lbs/A.
White fir - big huckleberry (CW S2 11)	Vegetation recovers in 2-4 yrs, increases by 5-7 yrs due tree canopy opening; shrubs sprout, herbaceous largely forbs.	Pinegrass Mtn. sweetroot	Not range type - Moder. change in native spp. with tree canopy change	Good, far out-produces native Moist site grp.	Stock - low Wldlf - low Reveg.- moder.	No native stock value; with optimum TM (70-50% tree canopy) seeded forage in skid trails can produce 150-300 lbs/A for stock of wldlf.
White fir - grouse huckleberry (CW S8 11)	Rather scant vegetation reduced 10-20% on ash soils, slow to recover due cold soils, short growing season.	Pinegrass N.W. sedge	Not range type - sparce vegetation increases slowly due cold soils.	Fair - cold soil High elev. site group	Stock - low Wldlf - low Reveg.- moder.-	Grouse hucklebrry indicates cold soil & short growing season; forage type plants not well suited to the site - limited grazing potential.
Sub-alpine fir - big huckleberry (CE S3 11)	Vegetation recovers in 4-8 yrs, increase by 9-12 yr due tree canopy opening; shrubs sprout, herbaceous largely forbs.	N.W. sedge Pachistima	Not range type - Moder. to slow change due short growing season	Fair - due short growing season High elev. site group	Stock - low Wldlf - low Reveg.- moder.	Sub-alpine fir indicates short, cool growing season; forage type plants not well suited to the site limited grazing potential.
Sub-alpine fir - grouse huckleberry (CE S4 11)	Rather scant vegetation reduced 10-20% on ash soils, slow to recover, shrubs sprout, many herbs tap rooted	Pachistima N.W. sedge	Not range type - sparce vegetation slow to increase	Fair to poor due cold soil, short High elen. site	Stock - low Wldlf - low Reveg.- low+	Sub-alpine fir and grouse huckleberry indicate cold soil and growing season; forage type plants not well suited - limited grazing.

FORESTED TYPES

TIMBER MANAGEMENT SECTION I

(1) Tree Productivity: Volume Classes from "Field Instructions for Integrated Forest Survey and Timber Management Inventories in Oregon, Washington and California", Section V: Area Classification (Item 51 of 1969 edition, pV-1). Bd.ft. were calculated by multiplying cu.ft. by 5, DBH conversion not made.
(2) Natural Regeneration: Probability of 5 Year Establishment means the likelyhood of having satisfactory number of seedlings established 5 years after regeneration harvest as follows: Low = less than 33% chance of satisfactory establishment, Moderate = 34-80% chance, High = better than 80% chance. Ease of natural establishment is often influenced by range condition - good condition = maximum grass and maximum initial competition, poor condition little competition.
(3) Artificial Regeneration: Species Suitability means relative suitability by species for successful establishment and growth - Poor = species not adapted to the site or success in planting has not been satisfactory, Fair = moderate success or suitability, Good = Best suited species, best success by planting. PP = ponderosa pine, LP = lodgepole pine, DF = Douglas-fir, WF = white (grand) fir, AF = alpine fir, WL = western larch, WP = white pine, ES = Engelmann spr.
(4) Pre-commercial Thinning Need: Need for thinning due to stagnation potential of the site - Low means low need and low stagnation potential, Moderate means stagnation tendencies and some need for pre-commercial thinning, High means high stagnation probability and need for thinning. Stocking is based upon Growth Basal Area data in "Summary of Productivity Data"; (% variability) is the % of E.05 as an index of latitude for estimating post pre-commercial stocking.

Plant Community	(1) Tree Productivity: Volume Class Cu.ft./A/Yr (Bd.ft./A/Yr)	(2) Natural Regeneration Probability of 5 Year Establishment	(3) Artificial Regeneration Species Suitability Need & Type Site Preparation	(4) Pre-commercial Thinning Need (Stagnation Potential) Stocking by DBH (% variability)
Ponderosa pine - wheatgrass (CP G1 11)	Non-productive (7) less 20 (less 100 bf)	S slope, good range - very low N slope, poor range - low (shelterwood)	PP-fair High need to control grass, shrubs Moder. need shrubs after 5 yrs	High need for pre-commercial thin 6"=80, 8"=45, 10"=30 (22%)
Ponderosa pine - fescue (CP G1 12)	Non-productive (7) less 20 (less 100 bf)	S slope, good range - low N slope, poor range - low (shelterwood)	PP - good High need to control grass, shrubs Moder. need shrubs after 5 yrs.	High need for pre-commer. thin 6"=157, 8"=90, 10"=55 (11%)
Ponderosa pine - bitterbrush - Ross sedge (CP S2 21)	Low (6) 20-49 cu.ft. (100-250 bd.ft.)	S slope, good range - low N slope, poor range - moderate (shelterwood)	PP - good Moder. need control shrubs, grass	High need for pre-commer. thin 6"=200, 8"=110, 10"=70 (15%)
Ponderosa pine - blue wildrye (CP M1 11)	Low (6) 20-49 cu.ft. (100-250 bd.ft.)	S slope, good range - low N slope, poor range - moderate (shelterwood)	PP - good, DF - fair High need to control grass (rhizom)	Moderate need for pre-commer.thin 6"=200, 8"=110, 10"=70 (24%)
Ponderosa pine - Douglas-fir - elk sedge (CD G1 11)	Low (6) 20-49 cu.ft. (100-250 bd.ft.)	S slope, good range - low PP,DF N slope, poor range - mod. PP low DF (shelterwood)	PP - good, DF - poor High need to control grass (rhizom)	High need for pro-commer. thin 6"=250, 8"=140, 10"=90 (10%)
Ponderosa pine - Douglas-fir - snowberry - ocean-spray (CD S6 11)	Mod. low (5) 50-84 cu.ft. (250-425 bd.ft.)	S. slope, good range - low PP,DF N slope, poor range - Mod. PP,DF (shelterwood)	PP - good, DF - good, WF - poor High need shrub control, mod.grass High need shrub after 5 yr.	High need PP, Moder. need DF 6"=420, 8"=235, 10"=150 (24%)
Ponderosa pine - Douglas-fir - ninebark (CD S7 11)	Low + (6+) 20-49 cu.ft. (100-250 bd.ft.)	S slope, good range - low PP,DF N slope, poor range - Mod.PP,DF (shelterwood)	PP - good, DF - good, WL - good High need shrub control, mod.grass High need shrub after 5 yr	High need PP, moder. need DF 6"=360, 8"=210, 10"=130 (15%)
Mixed conifer - pinegrass residual soil (CW G1 11)	Low (6) 20-49 cu.ft. (100-250 bd.ft.)	S slope, good range: Mod PP Low DF,WF N slope, poor range: High PP Mod DF,WF (shelterwood)	PP - good, DF - fair, WF - poor WL - poor High need to control grass (rhizom)	High need PP, moder. need DF,WF 6"=310, 8"= 175, 10"= 110 (9%)
Mixed conifer - pinegrass ash soil (CW G1 12)	Mod. low (5) 50-84 cu.ft. (250-425 bd.ft.)	S slope, good range: Mod PP Low DF,WF N slope, poor range: High PP Mod DF,WF (shelterwood)	PP - good, DF - good, WF - fair, WL - fair, LP - fair High need to control grass (rhizom)	High need PP, moder. need DF,WF,WL 6"=375, 8"= 210, 10"= 135 (8%)
Lodgepole - pinegrass - grouse huckleberry (CL G2 11)	Low+ (6+) 20-49 cu.ft. *(100-250 bd.ft.) *small DBH limits bf	Clearcut: LP-S.slope mod, N. high WF-S.slope low, N. low Shelterwd: LP-S.slope High, N.high WF-S.slope low, N.moder	LP - good, DF - fair, WF - poor WL - good (PP - poor) Low need after clearcut - grass Moder. need after shelterwd - grass	High need LP, Moder. DF, low WF 6"=330, 8"=190, 10"=120 (42%)
Lodgepole - big huckleberry (CL S5 11)	Low (6) 20-49 cu.ft. *(100-250 bd.ft.) *small DBH limits bf	Clearcut: LP-S.slope mod, N. high WF-S.slope low, N.mod. Sheltrwd: LP-S.slope high, N.high WF-S.slope low, N.mod.	LP - good, WL - good, DF - fair, WF - poor (PP - poor) Low need after clearcut - shrubs Mod. need after sheltrwd - shrubs	High need LP, Low need DF,WF,WL 6"= 290, 8"= 165, 10"= 105 (33%)
Lodgepole - grouse huckleberry (CL S4 11)	Low (6) 20-49 cu.ft. *(100-250 bd.ft.) *small DBH limits bf	Clearcut: LP-S.slope low, N. high ES,AF-S.slope low, N.mod. Sheltrwd: LP-S.high, N. high ES,AF-S.slope low, N.mod.	LP - good, WL - fair, ES,AF - fair (PP,WF,DF - poor) Limit site preparation - retain litter and mulch, frost heaving	High need LP, Moder. ES,AF 6"=280, 8"=155, 10"=100 (17%)
White fir - twinflower - forb (CW F3 11)	Moderate (4) 85-119 cu.ft. (425-600 bd.ft.)	Clearcut: WF-S.slope low, N.mod. WL,LP-S.slope mod, N.high Sheltrwd: WF-S.slope high, N.high WL,LP-S.slope high, N.mod.	DF,WL - good, WF,WP - fair, LP - good (PP,ES,AF - poor) low need - easiest regen.site Mod need for grass after 5 yr.	Low need for WF,DF,WL, mod. LP 6"=660, 8"=370, 10"=235 (12%)
White fir - big huckleberry (CW S2 11)	Mod. low (5) 50-84 cu.ft. (250-425 bd.ft.)	Clearcut: WF-S.slope low, N. mod. WP,WL,LP-S.slope mod, N.high Sheltrwd: WF-S.slope mod, N.high WP,WL,LP-S.slope high, N.high	DF,WL,- good, WF,WP,ES - fair LP - good (PP,AF - poor) Low need after clearcut - shrubs Low need after sheltrwd - shrubs	Low need DF,WF,WL,WP,ES, Mod. LP 6"=510, 8"=285, 10"=180 (12%)
White fir - grouse huckleberry (CW S8 11)	Mod. low (5) 50-84 cu.ft. (250-425 bd.ft.)	Clearcut: WF-S.slope low, N.mod. LP,PP,WL-S.slope mod, N.high Sheltrwd: WF-S.slope mod, N.high LP,PP,WL-S.slope high, N.mod.	DF,WL - good, WF,PP,ES - fair LP - good Low, limit site prep. to retain some litter & mulch, frost heav	Low need for WF,DF,WL,ES, Mod.LP,PP 6"=460, 8"=260, 10"=165 (37%)
Sub-alpine fir - big huckleberry (CE S3 11)	Mod. low (5) 50-84 cu.ft. (250-425 bd.ft.)	Clearcut: AF,ES-S.slope low, N.mod LP-S.slope mod, N.mod Sheltrwd: AF,ES-S.slope mod, N.high LP-S.slope high, N.high	LP,ES - good, AF - fair, WF - poor Low need after clearcut, shrubs Moderate need after sheltrwd.	Moderate need EF,ES, high LP 6"=430, 8"=240, 10"=155 (15%)
Sub-alpine fir - grouse huckleberry	Low (6) 20-49 cu.ft. (100-250 bd.ft.)	Clearcut: AF,ES-S.slope low, N.low LP-S.slope low, N.mod Sheltrwd: AF,ES-S.slope mod, N.high LP-S.slope mod, N.high	LP - good, ES - fair, AF - poor Limit site preparation - retain litter and mulch, frost heaving	Moderate need AF,ES, high LP 6"=300, 8"=170, 10"=110 (17%)

FORESTED TYPES

TIMBER MANAGEMENT SECTION II

(1) Disease and Insect problems relate to unmanaged, natural stands unless noted. Stand treatment and stocking level control greatly influence both insect and disease problems, i.e. open spacing in lodgepole tends to encourage mountain pine beetle while in ponderosa it tends to discourage the beetle.
(2) Operability is assumed to be tractor-type logging where slopes over 30% are generally restricted in suitability; where conditions require slopes less than 30%, they will be noted; otherwise, special constraints on ground skidding will be noted. Thay may range from deep snow to extreme compactability.

Plant Community	(1) Disease Potential	(1) Insect Risk	Windthrow Hazard	Pocket Gopher Potential	(2) Operability	Special Problems
Ponderosa pine - wheatgrass (CP G1 11)	Low for rots, mistletoe	Low for bark beetle Low foliage insects	Low	Low		Non-productive(commercial) site; stony, shallow soils limits planting, gophers.
Ponderosa pine - fescue (CP G1 12)	Low for rots, listletoe	Low for bark beetle Low foliage insects	Low	Low generally Moderate on ash soil		Marginally productive site, density of shrubs influences tree growth.
Ponderosa pine - bitterbrush - Ross sedge (CP S2 11)	Low for rots Moderate for mistletoe	Low for beetles	Moderate-stony, sandy soil	Low		Stony to very stony soils limit planting. Low fertility soils.
Ponderosa pine - blue wildrye (CP M1 11)	Low for rots, mistletoe	Low for beetles	Low	High - good forage, close to water	Limited by soil compactability when wet to moist	Meadow type soils - dark brown to black, limit reproduction, traffic when wet.
Ponderosa pine - Douglas-fir - elk sedge (CD G1 11)	Low for rots Moderate for mistletoe	Low for bark beetles	Low to moderate	Low	Some limit due to soil compaction on l and sil soils	Some soils too stony for easy planting.
Ponderosa pine - Douglas-fir - snowberry - oceanspray (CD S6 11)	Low for rots Moderate mistletoe - PP	Moderate bark beetle Low foliage insects on DF	Low	Low to mod.on ash soil	Some compactabil. on sil soils when wet	Shrubs sprout following fire or disturbance - can cause moderate to severe competition to young trees.
Ponderosa pine - Douglas-fir - ninebark (CD S7 11)	Rots:low - PP, mod. DF Mistletoe:mod. - PP, low - DF	Mod. bark beetle-PP Mod. foliage DF	Low	Low		Shrubs sprout following fire or disturbance - can cause moderate to severe competition to young trees.
Mixed conifer - pinegras Residual soil (CW G1 11)	Rots: low - PP, high WF Mistletoe: mod. to high for PP, low-mod DF,WF	Mod. bark beetle PP Mod. to high foliage for WF, mod. DF Mod. grass bug	Low	Low		Some soils too stony for easy planting.
Mixed conifer - pinegras Ash soil (CW G1 12)	Rots:low - PP, high WF Mistletoe: mod. to high for PP, low-mod DF,WF	Mod. bark beetles Mod. to high foliage for WF,DF. Mod. grass bug	Moderate	Moderate in clearcuts close to water	Some limit on 20% to 30% slopes due erosion (ash soil)	
Lodgepole - pinegrass - grouse huckleberry (CL G2 11)	Low for rots, mistletoe	Moderate to high for bark beetles Mod. grass bug	Low	Moderate in clearcut close to water		Lodgepole will tend to regenerate under clearcut or shelterwood harvest - if conversion to fir is desired, lodgepole will require control; low bd.ft. product.
Lodgepole - big huckleberry (CL S5 11)	Low for rots, mistletoe	Moderate to high for bark beetles	Low	Moderate in clearcuts close to water		Lodgepole will tend to regenerate in clearcut or shelterwood - if conversion to fir is desired, lodgepole will require control; small DBH limits bd.ft. production.
Lodgepole - grouse huckleberry (CL S4 11)	Low for rots, mistletoe	Moderate to high for bark beetles	Moderate	Low to moderate clearcuts close to water		Lodgepole regenerates in clearcut or shelterwood, if conversion to fir or spruce is desired, must control lodgepole small DBH limits bd.ft. production.
White fir - twinflower-forb (CW F3 11)	Low for rots - WF,DF,WL Mod.for mistletoe - DF, WL, low - DF	Low for bark beetle Mod to high for foliage insects	Moderate	Mod. to high in clearcuts close to water	Some limit on 20-30% slopes due to erosion (ash soil)	
White fir - big huckleberry (CW S2 11)	Mod.for rots - WF,DF,WL Mod. for mistletoe - DF, WL,WF	Low to mod. bark b. Mod to high for foliage insects	Moderate	Moderate on clearcuts close to water	Some limit on 20-30% slopes due to erosion (ash soil)	
White fir - grouse huckleberry (CW S8 11)	Mod. to high for rots Moderate for mistletoe WF, DF, WL, ES	Low to mod.bark b. Low to mod. for foliage insects	Moderate - high	Moderate on clearcut close to water	Limits: deep, long snow season, 20-30% slopes (ash soil)	Grouse huckleberry indicates cold soils and potential regeneration problems.
Sub-alpine fir - big huckleberry (CE S3 11)	Mod. for rots - ES,EF, Low to mod. for mistle.	Low to mod. bark b. Low to mod. foliage	Moderate	Moderate on clearcuts close to water	Some limit on 20-30% slopes due to erosion (ash soil)	Sub-alpine fir indicates moderately cold climate and regeneration probelms.
Sub-alpine fir - grouse huckleberry (CE S4 11)	Mod. for rots - ES,AF Low for mistletoe	Low to mod. bark b. Low to mod foliage	Moderate	Moderate on clearcut close to water	Limits: deep, long snow season, 20-30% slopes due to erosion (ash soil)	Both grouse huckleberry and sub-alpine fir indicate cold to very cold climate and soils which cause regeneration problems.

SPECIES LIST A: Common Names

Common Name	Scientific Name
Alpine fescue	Festuca idahoensis
Alpine sagebrush	Artemisia tridentata var. vaseyana
Alpine sedge	Carex geyeri and C. hoodii, (alpine)
Anemone	Anemone oregana
Balsamroot	Balsamorhiza spp.
Bentgrass	Agrostis spp.
Bighead clover	Trifolium macrocephalum
Big huckleberry	Vaccinium membranaceum
Big sagebrush	Artemisia tridentata
Biscuitroots	Lomatium spp.
Bitterbrush	Purshia tridentata
Bluegrass (scabland)	Poa sandbergii (vis. P. secunda)
Blue wildrye	Elymus glaucus
Broad leaved lupine	Lupinus latifolius
Bunchgrass	Festuca idahoensis, Agropyron spicatum
California oatgrass	Danthonia californica
California strawberry	Fragaria vesca crinita
Cheatgrass	Bromus tectorum
Columbia brome	Bromus vulgaris
Curlleaf mountain - mahogany	Cercocarpus ledifolius
Douglas-fir	Pseudotsuga menziesii var. glauca
Dwarf squirreltail	Sitanion hystrix var. hordeoides
Elk sedge	Carex geyeri
Engelmann spruce	Picea engelmannii
False hellebore	Veratrum californicum
Fescue	Festuca idahoensis
Fleeseflower	Polygonum phytolaccaefolium
Grand fir	Abies grandis
Green fescue	Festuca viridula
Grouse huckleberry	Vaccinium scoparium
Heartleaf arnica	Arnica cordifolia
Hood sedge	Carex hoodii
Huckleberry	Vaccinium membranaceum
Juniper	Juniperus occidentalis
Kentucky bluegrass	Poa pratensis
Larch	Larix occidentalis
Lodgepole pine	Pinus contorta
Low sagebrush	Artemisia arbuscula
Mahogany	Cercocarpus ledifolius
Mitella	Mitella stauropetala
Mixed conifer	Abies grandis, Pseudotsuga menziesii, Pinus Ponderosa
Mountain sweetroot	Osmorhiza chilensis
Nebraska sedge	Carex nebraskensis
Needlegrass	Stipa occidentalis
Ninebark	Physocarpus malvaceus
Northwestern sedge	Carex concinnoides
Oceanspray	Holodiscus discolor
Onespike oatgrass	Danthonia unispicata
Ovalhead sedge	Carex festivella
Pacific yew	Taxus brevifolia
Pachistima	Pachistima myrsinites
Phlox	Phlox spp.
Pinegrass	Calamagrostis rubescens
Pipsissewa	Chimaphila umbellata
Pokeweed fleeseflower	Polygonum phytolacceafolium
Ponderosa pine	Pinus ponderosa
Prairie junegrass	Koeleria cristata
Pussytoes	Antennaria spp.
Pyrola	Pyrola secunda
Quaking aspen	Populus tremuloides
Ross sedge	Carex rossii
Sandberg bluegrass	Poa sandbergii (vis. P. secunda)
Sandwort	Arenaria spp.
Sedge	Carex spp.
Snowberry	Symphoricarpos albus
Spirea	Spirea betulifolia
Squirreltail	Sitanion hystrix
Stiff sage	Artemisia rigida
Strawberry	Fragaria spp.
Sub-alpine fir	Abies lasiocarpa
Sweetroots	Osmorhiza spp.
Thinleaf alder	Alnus incana
Tufted hairgrass	Deschampsia caespitosa
Twinflower	Linnaea borealis
Veratrum	Veratrum californicum
Western hawkweed	Hieracium albertinum, H. scouleri
Wheatgrass	Agropyron spp.
Whitebark pine	Pinus albicaulis
White fir	Abies grandis
White hawkweed	Hieracium albiflorum
Wyeth buckwheat	Eriogonum heracleoides
Yarrow	Achillea millefolium

SPECIES LIST B: Scientific Names

Scientific Name	Common Name(s)
Achillea millefolium	Yarrow
Abies grandis	Grand, white fir
Abies lasiocarpa	Sub-alpine fir
Agropyron spicatum	Wheatgrass
Agrostis spp.	Bentgrass
Alnus incana	Thinleaf alder
Anemone oregana	Anemone
Antennaria spp.	Pussytoes
Arenaria spp.	Sandwort
Arnica cordifolia	Heartleaf arnica
Artemisia arbuscula	Low sagebrush
Artemisia rigida	Stiff sage
Artemisia tridentata	Big sagebrush
Artemisia tridentata var. vaseyana	Alpine sagebrush
Balsamorhiza spp.	Balsamroot
Bromus tectorum	Cheatgrass
Bromus vulgaris	Columbia brome
Calamagrostis rubescens	Pinegrass
Carex concinnoides	Northwestern sedge
Carex festivella	Ovalhead sedge
Carex geyeri	Elk sedge
Carex hoodii	Hood sedge
Carex nebraskensis	Nebraska sedge
Carex rossii	Ross sedge
Cercocarpus ledifolius	Curlleaf mountain-mahogany
Chimaphila umbellata	Pipsissewa
Danthonia californica	California oatgrass
Danthonia unispicata	Onespike oatgrass
Deschampsia caespitosa	Tufted hairgrass
Elymus glaucus	Blue wildrye
Eriogonum heracleoides	Wyeth buckwheat
Festuca idahoensis	Idaho fescue, fescue
Festuca viridula	Green fescue
Fragaria vesca crinita	Strawberry, California strawberry
Hieracium albertinum	Western hawkweed
Hieracium albiflorum	White hawkweed
Hieracium scouleri	Western hawkweed
Holodiscus discolor	Oceanspray
Juniperus occidentalis	Juniper
Koeleria cristata	Prairie junegrass
Larix occidentalis	Larch
Linnaea borealis	Twinflower
Lomatium spp.	Biscuitroots
Lupinus latifolius	Broad leaved lupine
Mitella stauropetala	Mitella
Osmorhiza chilensis	Mountain sweetroot
Pachistima myrsinites	Pachistima
Phlox spp.	Phlox
Physocarpus malvaceus	Ninebark
Picea engelmannii	Engelmann spruce
Pinus albicaulis	Whitebark pine
Pinus contorta	Lodgepole pine
Pinus ponderosa	Ponderosa pine
Poa pratensis	Kentucky bluegrass
Poa sandbergii (vis. P. secunda)	Sandberg bluegrass bluegrass scabland
Populus tremuloides	Quaking aspen
Polygonum phytolaccaefolium	Fleese flower, pokeweed fleeseflower
Pseudotsuga menziesii var. glauca	Douglas-fir
Purshia tridentata	Bitterbrush
Pyrola secunda	Pyrola
Sitanion hystrix	Squirreltail
Sitanion hystrix var. hordeoides	Dwarf squirreltail
Spirea betulifolia	Spirea
Stipa occidentalis	Needlegrass
Symphoricarpos albus	Snowberry
Taxus brevifolia	Pacific yew
Trifolium macrocephalum	Bighead clover
Vaccinium membranaceum	Big huckleberry, huckleberry
Vaccinium scoparium	Grouse huckleberry
Veratrum californicum	Veratrum, false hellebore

SPECIES LIST C. Revegetation Plants

Common Name	Scientific Name	Variety	Characteristics
DRY SITES:			
Siberian wheatgrass	Agropyron sibiricum		Sandy textured soils
Russian wildrye	Elymus junceus	Vinall	Slow to start spring and fall feed
Crested wheatgrass	Agropyron desertorum	Nordan	Develops wolf plants
Fairway wheatgrass	Agropyron cirstatum	(Fairway)	Less wolf plant problem
Dwarf yellow sweetclover	Melilotus officinalis	Madrid	Biennial, limited life span
Sherman big bluegrass	Poa ampla	Sherman	Winter active, seed shallow depth
Whitmar beardless wheat.	Agropyron inerme		Slow to establish, later readiness
Hard Fescue	Festica ovina duriuscula	Durar	Slow to establish, mod. low forage
Pubescent wheatgrass	Agropyron trichophorum	Topar	Sod, low palatability, good cover
Streambank wheatgrass	Agropyron riparium	Sodar	Sod, low palatability, erosion spp.
Thickspike wheatgrass	Agropyron dasystachyum		Sod, sandy soils, later than crested
Alfalfa (dryland)	Medicago sativa	Ladak	Rapid developing, moderate life
Bitterbrush	Purshia tridentata	(local)	Collect local seed, has been contr.
MOIST SITES (Pasture type plants):			
Slender wheatgrass	Agropyron trachycaulum	Primar	Moderate life, rapid developing
Intermediate wheatgrass	Agropyron intermedium	Greenar	Sod, mod. palatability, drier sites
Mountain bromegrass	Bromus marginatus	Bromar	Rapid developing, palat., poor soil
Blue wildrye	Elymus glaucus	P-2662	Sod, rapid developing, mod. palat.
Alta tall fescue	Festuca arundinacea	Alta	Rapid developing, mod. low palat.
Tall oatgrass	Arrhenatherum elatius	Tualatin	Easily damaged by grazing, palatable
Orchardgrass	Dactylis glomerata	Potomac	Highly palatable, shade tolerant
Timothy	Phleum pratense	Drummond	Short lived, bulbs encourage rodents
Smooth brome	Bromus inermus	Manchar	Sod, highly palatable, long lived
Meadow brome	Bromus biebersteinii	Regar	Sod, highly palat., prod., long lived
White clover	Trifolium repens	Wht.Dutch	Persistence requires grazing, palat.
Cicar milkvetch	Astragalus cicer	Cicar	Sod, need specific inoculant, palat.
Sainfoin	Onobrychis viciaefolia	Onar	Palatable to stock and game
Redstem ceanothus	Ceanothus sanguineus	(native)	Not native to Blues, will produce
MOIST MEADOW SITES, drier wet meadows.			
Kentucky bluegrass	Poa pratensis	Cougar	Sod, highly grazing resistant,
Tall fescue	Festuca arundinacea	Alta	Rapid developing, mod.low palat.
Meadow foxtail	Alopecurus pratensis		Sod, highly palat., hard to seed
Meadow brome	Bromus biebersteinii	Regar	Sod, highly palat., long lived
Timothy	Phleum pratense	Drummond	Short lived, bulbs encourage rodents
LOW FERTILITY SITES and "B" or "C" horizon subsoils:			
Hard fescue	Festuca ovina duriuscula	Durar	Slow to establish, mod. low forage
Slender wheatgrass	Agropyron trachycaulum	Primar	Moderate life, rapid developing
Pubescent wheatgrass	Agropyron trichophorum	Topar	Sod, low palatability, good cover
Canada bluegrass	Poa compressa		Sod, slow developing, low product
Sherman big bluegrass	Poa ampla	Sherman	Winter active, seed shallow depth
Streambank wheatgrass	Agropyron riparium	Sodar	Sod, low palatability, erosion spp.
Blue wildrye	Elymus glaucus	P-2662	Sod, rapid developing, mod. palat.
HIGH ELEVATION SITES and upper frost pockets:			
Timothy	Phleum pratense	Drummond	Short lived, bulbs encourage rodents
Mountain bromegrass	Bromus marginatus	Bromar	Rapid developing, palatable
Hard fescue	Festuca ovina duriuscula	Durar	Slow to establish, mod. low forage
Orchardgrass	Dactylis glomerata	Potomac	Highly palatable, shade tolerant
Canada bluegrass	Poa compressa		Sod, slow developing, low product.
Pubescent wheatgrass	Agropyron trichophorum	Topar	Sod, low palatability good cover
Blue wildrye	Elymus glaucus	P-2662	Sod, rapid developing, mod. palat.
Slender wheatgrass	Agropyron trachycaulum	Primar	Moderate life, rapid developing

GPO 989-976